

RESEARCH STUDIES¹

OF THE

Expanded Food and Nutrition Education Program



Expanded Food And Nutrition Education Program: 1989 - 2008

Version 3, **August, 2008**

EFNEP

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¹The purpose of this bibliography is to document additional research studies conducted since the printing of the original bibliography, "The Expanded Food and Nutrition Education Program Annotated Bibliography 1968 - 1988". However, there may be studies included in this bibliography that were conducted in or prior to 1988, because they were not a part of the original document.

CONTENTS

	Page
Congressional Legislation Pertaining to EFNEP.....	3
Preface.....	7
Section I - National Research Studies.....	8
Section II - State Published Research Studies.....	17
Section III - State Studies Presented at Professional Meetings.....	58
Section IV - Research Studies Outside of The United States.....	58
Section V - Subject Index.....	63
A. Characteristic-Specific Audiences (pregnant, breastfeeding, etc.)	
B. Cost-Benefit Analysis	
C. Disease Prevention (including obesity prevention)	
D. EFNEP-Like Programs	
E. Evaluation of Staff	
F. Food Insecurity	
G. Food Safety	
H. Material Development	
I. Methods of Evaluation	
J. Obesity	
K. Paraprofessional Training and Competencies	
L. Physical Activity	
M. Program Delivery Strategies/Methods	
N. Program Review	
O. Race-Specific Audiences	
P. Studies on Retention of Knowledge and Improved Practices	
Q. Welfare Reform	
R. Youth Evaluation	
S. Youth Intervention	
Section VI. - Author Index.....	65
Section VII. - Chronological Index.....	76

CONGRESSIONAL LEGISLATION PERTAINING TO EFNEP

The legislative intent of Congress related to the Expanded Food and Nutrition Education Program (EFNEP) is cited in the following legislation:

SEC. 1425.⁽⁹¹⁾ (a) The Secretary shall establish a national education program which shall include, but not be limited to, the dissemination of the results of food and human nutrition research performed or funded by the Department of Agriculture.

(b)⁽⁹²⁾ In order to enable low-income individuals and families to engage in nutritionally sound food purchasing and preparation practices, the expanded food and nutrition education program conducted under section 3(d) of the Act of May 8, 1914 (7 U.S.C. 343(d)), shall provide for the employment and training of professional and paraprofessional aides to engage in direct nutrition education of low-income families and in other appropriate nutrition education programs. To the maximum extent practicable, such program aides shall be hired from the indigenous target population.

(c)⁽⁹³⁾ Beginning with the fiscal year ending September 30, 1982—

(1) Any funds annually appropriated under section 3(d) of the Act of May 8, 1914, for the conduct of the expanded food and nutrition education program, up to the amount appropriated under such section for such program for the fiscal year ending September 30, 1981, shall be allocated to each State in the same proportion as funds appropriated under such section for the conduct of the program for the fiscal year ending September 30, 1981, are allocated among the States; with the exception that the Secretary may retain up to 2 per centum of such amount for the conduct of such program in States that did not participate in such program in the fiscal year ending September 30, 1981.

(2) Any funds appropriated annually under section 3(d) of the Act of May 8, 1914, for the conduct of the expanded food and nutrition education program in excess of the amount appropriated under such section for the conduct of the program for the fiscal year ending September 30, 1981, shall be allocated as follows:

(A) 4 per centum shall be available to the Secretary for administrative, technical, and other services necessary for the administration of the program.

(B) The remainder shall be allocated among the States as follows:

(i) 10 per centum shall be distributed equally among all States; and

(ii) the remainder shall be allocated to each State in an amount which bears the same ratio to the total amount to be allocated under this subparagraph as the population of the State living at or below 125 per centum of the income poverty guidelines prescribed by the Office of Management and Budget (adjusted pursuant to section 673(2) of the Omnibus Budget Reconciliation Act of 1981 (42 U.S.C. 9902)), bears to the total population of all the States living at or below 125 per centum of the income poverty guidelines, as determined by the last preceding decennial census at the time each such additional amount is first appropriated. The provisions of this subparagraph shall not preclude the Secretary from developing educational materials and programs for persons in income ranges above the level designated in this subparagraph.

(3)⁽⁹⁴⁾ There is authorized to be appropriated to carry out the expanded food and nutrition education program established under section 3(d) of the Act of May 8, 1914 (38 Stat. 373,

chapter 79; 7 U.S.C. 343(d)) and this section \$83,000,000 for each of fiscal years 1996 through 2007.⁽⁹⁵⁾

In 1996, Congress amended section 3(d) by adding a second sentence, which now reads:

1. A college or university eligible to receive funds under the Act of August 30, 1890 (7 U.S.C. 321 et seq.), including Tuskegee University, may apply for and receive directly from the Secretary of Agriculture—
 - (1) amounts made available under this subsection after September 30, 1995, to carry out programs or initiatives for which no funds were made available under this subsection for [FY] 1995, or any previous [FY], as determined by the Secretary; and
 - (2) amounts made available after September 30, 1995, to carry out programs or initiatives funded under this subsection prior to that date that are in excess of the highest amount made available for the programs or initiatives under this subsection for [FY] 1995, or any previous [FY], as determined by the Secretary.

Federal Agriculture Improvement and Reform Act of 1996, § 883(a), Pub. L. 104-127, 110 Stat. 888, 1176 (1996).

1985 Food Security Act 1985 - Expanded Food and Nutrition Education Program - Sec. 1530. Section 11(f) of the Food Stamp Act of 1977 (7 U.S.C. 2020(f)) is amended by adding at the end thereof the following: “State agencies shall encourage food stamp program participants to participate in the expanded food and nutrition education program conducted under section 3(d) of the Act of May 8, 1914 (7 U.S.C. 343(d)), commonly known as the Smith-Lever Act and any program established under sections 1584 through 1588 of the Food Security Act of 1985. At the request of personnel of such education programs, state agencies, wherever practicable, shall allow personnel and information materials of such education program to be placed in food stamp offices.”

Nutrition Education Findings - Sec. 1584. Congress finds that individuals in households eligible to participate in programs under the Food Stamp Act of 1977 and other low-income individuals, including those residing in rural areas, should have greater access to nutrition and consumer education to enable them to use their food budgets, including food assistance, effectively and to select and prepare foods that satisfy their nutritional needs and improve their diets.

Purpose - Sec. 1585. The purpose of the program provided for under sections 1584 through 1588 is to expand effective food, nutrition, and consumer education services to the greatest practicable number of low-income individuals, including those participating in or eligible to participate in the programs under the Food Stamp Act of 1977, to assist them to—

- (1) increase their ability to manage their food budgets, including food stamps and other food assistance;

- (2) increase their ability to buy food that satisfies nutritional needs and promotes good health; and
- (3) improve their food preparation, storage, safety, preservation, and sanitation practices.

Program - Sec. 1586. The cooperative extension services of the states shall, with funds made available under this subtitle, carry out an expanded program of food, nutrition, and consumer education for low-income individuals in a manner designed to achieve the purpose set forth in section 1585. In operating the program, the cooperative extension services may use the expanded food and nutrition education program, and other food, nutrition, and consumer education activities of the cooperative extension services or similar activities carried out by them in collaboration with other public or private nonprofit agencies or organizations. In carrying out their responsibilities under the program, the cooperative extension services are encouraged to—

- (1) provide effective and meaningful food, nutrition, and consumer education services to as many low-income individuals as possible;
- (2) employ educational methodologies, including innovative approaches, that accomplish the purpose set forth in section 1585; and
- (3) to the extent practicable, coordinate activities carried out under the program with the delivery to low-income individuals of benefits under food assistance programs.

Administration - Sec. 1587. (a) The program provided for under section 1586 shall be administered by the Secretary of Agriculture through the Extension Service, in consultation with the Food and Nutrition Service and the Human Nutrition Information Service. The Secretary shall ensure that the Extension Service coordinates activities carried out under this subtitle with the ongoing food, nutrition, and consumer education activities of other agencies of the Department of Agriculture.

(b) The Secretary of Agriculture, not later than April 1, 1989, shall submit to the Committee on Agriculture of the House of Representatives and the Committee on Agriculture, Nutrition, and Forestry of the Senate a report evaluating the effectiveness of the program provided for under section 1586.

Authorization of Appropriations - Sec. 1588. (A) There are hereby authorized to be appropriated to carry out sections 1584 through 1588 \$5,000,000 for the fiscal year ending September 30, 1986; \$6,000,000 for the fiscal year ending September 30, 1987; and \$8,000,000 for each of the fiscal years ending September 30, 1988, September 30, 1989, and September 30, 1990.

(b) Any funds appropriated under this section for a fiscal year shall be allocated in the manner specified in subparagraphs (A) and (B) of section 1425 ©)(2) of the National Agricultural Research, Extension, and Teaching Policy Act of 1977.

c) Any funds appropriated to carry out sections 1584 through 1588 shall supplement any other funds appropriated to the Department of Agriculture for use by the Department and the cooperative extension services of the states for food, nutrition, and consumer education for low-income households. Public Law 99-198 – Dec. 23, 1985.

- 1981 The Agriculture and Food Act 1981 - Nutrition Education Program, Sec. 1423. Section 1425 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (& U.S.C. 3175), is amended to read as follows: “...(b) In order to enable low-income individuals and families to engage in nutritionally sound food purchasing and preparation practices, the expanded food and nutrition education program conducted under section 3(d) of the Act of May 8, 1914 (7 U.S.C. 343(d)) shall provide for the employment and training of professional and paraprofessional aides to engage in direct nutrition education of low-income families and in other appropriate nutrition education programs. Public Law 95-113.
- 1977 The Food and Agriculture Act 1977, Section 1425, of the National Agricultural Research, Extension and Teaching Policy Act 1977 (7 U.S.C. 3175); (b) In order to enable low-income individuals and families to engage in nutritionally sound food purchasing and preparation practices, the expanded food and nutrition education program, presently conducted under section 3(d) of the Act of May 8, 1914 (38 state. 373, as amended: 7 U.S.C. 343(d)), shall be expanded to provide for the employment and training of professional and paraprofessional aides to engage in direct nutrition education of low-income families and in other appropriate nutrition education programs. Public Law 95-113.
- 1970 In Fiscal Year 1970, EFNEP was funded with an appropriation of \$30 million under the Smith-Lever Act as 3(d) funding. (Smith Lever Act - U.S.C. 341-348). Public Law 91-127
- 1968 EFNEP was initiated by the U.S. Department of Agriculture in 1968, with \$10 million from Sec. 32 of An Act to Amend the Agricultural Adjustment Act, and for other purposes, August 1935, Chapter 641, 74th Congress 1st Sess., 49 Stat. 750 744.

PREFACE

The Expanded Food and Nutrition Education Program (EFNEP) operates in all 50 states and the 6 U.S. Territories. It has a rich history of effectively reaching limited resource youth and families with children and, through experiential education, helping them to gain the skills, knowledge and motivation to make positive behavior changes in the areas of improved dietary quality, food safety, food resource management and physical activity. EFNEP funds are appropriated by Congress to the Cooperative State Research, Education and Extension Service (CSREES) and distributed via a formula to the land-grant universities. State Cooperative Extension staff at the universities provide leadership, conduct training, prepare and select materials and curricula for use by county level paraprofessionals and volunteers.

EFNEP's unique position within the U. S. Department of Agriculture and the Land-grant universities provides a strong research-base for the outreach and educational intervention. As such, EFNEP has been the subject and delivery mode for many creative strategies to advance the field of nutrition education.

This publication builds on the work of a previous bibliography that summarizes the studies from the first 20 years of EFNEP:

Nancy B. Leidenfrost, The Expanded Food and Nutrition Education Program Annotated Bibliography 1968 - 1988. Extension Service, USDA. 1988.

The majority of the documents from this previous work have been added to the collection of the National Agricultural Library and "EFNEP" is a recognized search term in the Agricola database that was used for identification of many of the reports cited in this document.

<http://agricola.nal.usda.gov/> .

This bibliography covers the period from 1989 - 2006 and demonstrates the continued investment in research to advance the field of nutrition education. It is a dynamic working document that will be updated periodically.

For those who wish to gain a fuller understanding of EFNEP, you are invited to visit the CSREES website and view the impacts, successes, evaluation and other components listed there. This bibliography will be posted on that site and updates with additional references will be added over time. <http://www.csrees.usda.gov/nea/food/efnep/efnep.html>

Appreciation is given to Vanessa Estrada and Taijere White, student interns who helped to locate the materials and prepare some of the citations. Appreciation is also given to the many researchers, educators, graduate students and others who have contributed to the body of knowledge listed in this bibliography.

Section I

National Research Studies

This section of the bibliography contains 25 studies that were conducted by the United States Department of Agriculture and other national agencies. The studies are listed chronologically.

F1. Sylvia Montgomery & Wells Willis. Fiscal Year 2005 Impact and Review of the Expanded Food and Nutrition Education Program. CSREES, USDA, Washington, DC. May 2006

In FY'05 EFNEP reached 411,849 youth and 150,995 adults. An additional 556,784 family members were indirectly reached through the adult participants. The participants gain new skills in food preparation, shopping, storage, safety, and sanitation. They learn how to better manage their food budgets and related resources such as food stamps. Seventy-eight percent of EFNEP families were enrolled in one or more federal food-assistance programs at the time they enrolled in EFNEP. Nine percent more received benefits from one or more federal-assistance program due to assistance from EFNEP. The report documents additional statistical data of the program such as dietary intake, nutrition practices, food safety and food resource management.

F2. Wells Willis, Beverly Phillips, Donna Vandergraff, Daisy Seremba, Earl Merrill. The Whys, Hows, and Wherefores of Youth Evaluation. Workshop presented at the 2005 Annual Conference for the Society for Nutrition Education, Orlando, FL. <http://www.sne.org/> and <http://www.csrees.usda.gov/nea/food/efnep/neers5/neers5.html>, July 2005

Nutrition education for youth is expanding rapidly in response to the concern about childhood obesity, but how can we do a better job of telling the story of our impacts? How can we collect good data, summarize it in useful and meaningful ways, and increase our ability to compare results across programs and states? An extensive long-term project involving many states now has provided a flexible, usable framework and computer-based system for sharing evaluation tools, collecting data derived from use of the tools, and summarizing the results in ways that will be useful to a variety of youth nutrition education programs and settings.

F3. Wells Willis. Can Nutrition Education Change Behavior for Multiple Racial/Ethnic Groups? Presented at the International Society for Behavioral Nutrition and Physical Activity, Amsterdam, The Netherlands, June, 2005

Purpose: To share the key features of the Expanded Food and Nutrition Education Program (EFNEP) which has achieved remarkable behavior change related to dietary quality, physical activity, food resource management and food safety for 36 years. Background: A strong research base provides the foundation for, and maintains the quality and integrity of the experiential education program. Using many educational theories and implementation designs, including Social Cognitive Theory, Stages of Change, Facilitated Discussion and experiential learning within the context of an integrated curriculum and reinforced messages have been instrumental in its success. Key Points: This program, which is funded at a level of approx. \$60 million/year, has reached millions of low income youth and adults thru peer educators and volunteers. The multi-lesson series allows for the introduction of key skills, with opportunities to practice them in the class setting and at home. Subsequent lessons reinforce the learning, and add new concepts. An evaluation component is integral to the program, providing feedback to

clients and measuring impact, thus assuring accountability and continued improvements over time. As a result, adult graduates achieve the following impacts: 84% improve food resource, 88% improve nutrition practices, 67% improve food safety and 93 % improve diet quality. Conclusion: This program can be adapted for use in other countries. Curricula already exist in multiple languages, adapted for the food culture of the participants. Short video clips will illustrate the kept components of the delivery and accomplishments of participants.

F4. Wells Willis. Youth Evaluation - Web-Based Tools, Data Collection and Impact Reports for Nutrition and Physical Activity Education Programs. Presented at the International Society for Behavioral Nutrition and Physical Activity, Amsterdam, The Netherlands, June 2005

Purpose: To develop a standard set of age-appropriate evaluation tools that could be used to measure nutrition and physical activity knowledge, skills and behavior changes of youth receiving education programs on these topics. Methods: Multi-state university teams identified the key-learning concepts to be included in the overall nutrition education programs, and developed evaluation tools to measure knowledge gained and behaviors changed as a result of the formative development, followed by pilot testing in multiple states and for multiple delivery and implementation strategies. Testing included sample groups who did not receive the intervention compared to those who did. Results: Sets of instruments have been developed and tested for use with pre-school and early school-aged children, which can be used in group settings, or for individuals. Conclusion: A web-based repository has been created, which allows users to search for relevant tools, review tool development documentation, download the tool, and then capture the results from students, compute and print impact reports. The end-product will be demonstrated. Broad use of this resource will facilitate comparisons between various programs and allow for the inclusion of additional tools for other ages, programs and countries.

F5. Sylvia Montgomery, Wells Willis. EFNEP - Expanded Food and Nutrition Education Program 2004 National Impact Data.

http://www.csrees.usda.gov/nea/food/efnep/pdf/2004_impact.pdf, 2005

The Expanded Food and Nutrition Education Program (EFNEP) is a unique program that operates in nearly 800 counties throughout the 50 states and territories. EFNEP is designed to assist low-income audiences in acquiring the knowledge, skills, attitudes, and changed behavior necessary for nutritionally sound diets, and to contribute to their personal development and the improvement of the total family diet and nutritional well-being. EFNEP targets two primary audiences: low-income youth and low-income families with young children. In Fiscal Year 2004, EFNEP reached 378,206 youth and 157,809 adults; an additional 578,366 family members were indirectly reached through the adult participants. Document highlights additional pertinent statistical data for the 2004 fiscal year.

F6. Wells Willis. Can a Single, Coordinated Nutrition Education Program Improve Food Behaviors for all Race/Ethnicities? Presented at the International Society for Behavioral Nutrition and Physical Activity, Washington, D. C., June 2004

Yes! EFNEP (Expanded Food and Nutrition Education Program) has a rich 35 year history of helping low-income families make significant dietary and food practice changes. Data from 2003 on over 150,000 adult participants show positive improvements for all food groups in the Food Guide Pyramid, irrespective of the race or ethnicity of the participant. Specifically, mean intake servings increased by 0.8 for Bread & Cereals, 0.7 for Fruits, 0.8 for Vegetables, 0.5

for Dairy and 0.3 for Meats. Data summaries by race (White, Black, Hispanic, American Indian and Asian/pacific Islander) showed statistically significant (<.001) improvements for all food groups. The strong research base, clear program goals and objectives, intensive, integrated, experiential learning model and local flexibility yield an outstanding national program that addresses critical health issues today. Comparisons by race/ethnicity for food groups, nutrients, nutrition practices, food safety and food resource management will be illustrated. While differences are seen between groups for these measures, the differences are generally smaller between groups than within groups when comparing entry and exit data.

F7. Sylvia Montgomery & Wells Willis. EFNEP - Expanded Food and Nutrition Education Program 2003 National Impact Data.

http://www.csrees.usda.gov/nea/food/efnep/pdf/2003_brochure.pdf

June 2004

EFNEP is delivered as a series of lessons, often over several months, by paraprofessionals and volunteers, many of whom are indigenous to the target population. The hands-on, learn-by-doing approach allows the participants to gain the practical skills necessary to make positive behavioral changes. In 2003, a total of 2,139 paraprofessionals along with 32,751 volunteers delivered an average of 8.4 lessons to EFNEP adult participants and met with 14,172 youth groups for 165,559 hours of EFNEP instruction at 85,853 different group meetings. With more than 1,028 full-time-equivalent (FTE) staff devoted to EFNEP, 73% of that time was spent with adult participants. For the majority of the adult participants (78%), delivery was by way of a group environment, 16% one-to-one instruction, 4% a combination of the two instructions, and 2% through a different type of instruction (e.g., telephone, mailings, etc.). Sixty-six percent (66%) of adult participants completed the program, and 20% are continuing the program in the year 2004. Through EFNEP, participants learn self-worth—that they have something to offer their families and society. The document highlights additional statistical data from the 2003 fiscal year.

F8. United States General Accounting Office, Report to the Committee on Agriculture, Nutrition, and Forestry U.S. Senate, “Nutrition Education - USDA Provides Services through Multiple Programs, but Stronger Linkages among Efforts Are Needed”, *GAO-04-528*, 2004

GAO identified several key actions, based on research and performance-based management principles that increase the likelihood that programs providing nutrition education will achieve their goals. Examples of these actions include identifying program goals, tailoring services to meet the needs of participants, and collecting data on program results. The actions can be taken during program design, service delivery, and program monitoring and evaluation. USDA programs providing nutrition education that we reviewed – the Food Stamps Program; the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); the National School Lunch Program; the Child and Adult Care Food program; and the Expanded Food and Nutrition Education Program – generally incorporated the key program design actions likely to contribute to success.

F9. Sylvia Montgomery & Wells Willis. Expanded Food and Nutrition Education Program FY 2002 Program Impacts, <http://www.csrees.usda.gov/nea/food/efnep/pdf/2002-impact.pdf> April 2003

Poor health disproportionately affects minority and low-income U.S. populations. EFNEP focuses heavily on minority populations. In 2002, of the total EFNEP audience 32% were Hispanics, 29% were African Americans, 2% were Native Americans, and 3% Asian or Pacific Islanders. Recent studies have found the anomaly that people who are most food insecure (i.e., are missing meals because they do not have enough money to purchase food, or are worried about running out of food) are at greater risk for obesity than those who are food secure. This finding may relate to the feast-and-famine scenario. The women may run out of food near the end of the month, and then over eat highly palatable foods once resources become available. This binge and-restriction cycle can disrupt metabolic patterns and internal cues of satiety, leading over time to increases in body weight. The integrated curriculum taught in EFNEP helps to reach a high-risk audience with the skills they need to reduce their risk, including balancing their food resources to last throughout the month. The document highlights additional statistical data for the 2002 fiscal year.

F10. Brenda Lisi, Wells Willis, Susan Baker, Jennifer Anderson, Gayle Coleman. WIC and EFNEP - Partnerships that Benefit WIC Clients. Panel presentation at the Nutrition Connections Conference, Washington, DC, February 2003

Participants learned about 1) a successful 3-year WIC/EFNEP initiative focused on the neediest of WIC participants and 2) other current WIC/EFNEP partnerships across the country, their impacts, and lessons learned. WIC and EFNEP are natural partners to improve the diet and health of WIC participants. In the mid-1990's, Congress funded a 3-year Nutrition Education Initiative (NEI) for the Cooperative Extension System to partner with WIC to reach the neediest WIC participants. The NEI objectives were to 1) increase interagency cooperation, 2) increase knowledge and skills of WIC clients, and 3) improve nutrition behaviors of WIC clients. Seventy-four projects were funded, and as a result over 260 WIC clinics collaborated with CES to reach approximately 142,000 participants. Improvements in diet quality, food handling practices, infant feeding practices and breastfeeding initiation and duration were measured. Many of those have continued and lessons learned are being applied to other programming efforts. In addition, EFNEP-WIC partnerships are currently underway across the country assisting WIC clients to better utilize WIC Farmers' Market coupons, address nutrition and health needs of special groups such as pregnant teens, and help caregivers of young children develop appropriate feeding skills.

F11. United States General Accounting Office, Report to Congressional Requesters, "Fruits and Vegetables - Enhanced Federal Efforts to Increase Consumption Could Yield Health Benefits for Americans", *GAO-02-657*, 2002

This report (1) examines the health-related benefits associated with consuming the recommended servings of fruits and vegetables; (2) determines the extent to which overall fruit and vegetable consumption by Americans has improved under key federal nutrition policy, guidance, and education programs for the general public; (3) assesses the impact of key federal food assistance programs on fruit and vegetable consumption by program participants; and (4) identifies federal actions that experts recommend for increasing the consumption of fruits and vegetables, as well as some of the implications of those actions.

F12. M&R Strategic Services & Produce for Better Health Foundation, “The Fruit and Vegetable Consumption Challenge: How Federal Spending Falls Short of Addressing Public Health Needs”, 2002

Despite the consensus about the health benefits of fruit and vegetable consumption, public health officials remain concerned that consumption of fruits and vegetables in the United States is falling short of the levels recommended in the federal Food Guide Pyramid. The Produce for Better Health Foundation contracted with M&R Strategic Services to quantify the gap between recommended and actual consumption levels and to determine the size and scope of the gaps between federal guidelines for consuming fruits and vegetables and the allocation of federal funds to promote fruit and vegetable consumption. The report also examined the economic costs of major chronic diseases attributed to this inadequate consumption and the relationship between the amount of federal funding for various dietary change programs and its affect on their ability to promote dietary change. Based on the findings of these empirical analysis, this report also suggests policy options to help close fruit and vegetable consumption and funding gaps.

F13. United States General Accounting Office, Report to Congressional Committees, “Program Evaluation - Strategies for Assessing How Information Dissemination Contributes to Agency Goals”, *GAO-02-923*, 2002

Federal agencies are increasingly expected to focus on achieving results and to demonstrate, in annual performance reports and budget requests, how their activities will help achieve agency or government wide goals. We have noted that agencies have had difficulty explaining in their performance reports how their programs and activities represent strategies for achieving their annual performance goals. Agencies use information dissemination programs as one of several tools to achieve various social or environmental goals. In programs in which agencies do not act directly to achieve their goals, but inform and persuade others to act to achieve a desired outcome, it would seem all the more important to assure decision makers that this strategy is credible and likely to succeed. Various agencies, however, fail to show how disseminating information has contributed, or will contribute, to achieving their outcome-oriented goals. To assist agency efforts to evaluate and improve the effectiveness of such programs, we examined evaluations of five federal information dissemination program cases: Environmental Protection Agency (EPA), Compliance Assistance, the Eisenhower Professional Development Program, the Expanded Food and Nutrition Education Program (EFNEP), the National Tobacco Control Program, and the National Youth Anti-Drug Media Campaign. We identified useful evaluation strategies that other agencies might adopt. In this report, prepared under our own initiative, we discuss the strategies by which these five cases addressed their evaluation challenges.

F14. Sylvia Montgomery & Wells Willis. EFNEP Expanded Food and Nutrition Education Program FY 2001 Program Impacts. <http://www.csrees.usda.gov/nea/food/efnep/pdf/01-1facts.pdf>, May 2002

Data from the EFNEP Evaluation/Reporting System is used to measure food practices and dietary improvements. Ten key food-related practices were measured at entry into EFNEP and upon graduation. These behavior changes translate into significant improvements in daily living skills. Results based on data from 106,062 graduates show that: 83% improved in one or more food resource management practices (i.e., plans meals, compares prices, does not run out of

food or uses grocery lists); 87% improved in one or more nutrition practices (i.e., makes healthy food choices, prepares foods without adding salt, plans meals, reads nutrition labels or has children eat breakfast); and 67% improved in one or more of the food safety practices (i.e. thawing and storing foods properly). Report provides additional statistical data from fiscal year 2001. Additional data for the 2001 fiscal year is also highlighted.

F15. Sylvia Montgomery & Well Willis. Cooperative State, Research, Education, and Extension Service - EFNEP - Expanded Food and Nutrition Education Program.

<http://www.csrees.usda.gov/nea/food/efnep/pdf/00facts.pdf> February 2001

The dietary intake of six key nutrients that are often limited in the diets of low-income audiences: protein, iron, calcium, Vitamin A, Vitamin C, and Vitamin B₆ are also measured. As figure 3 illustrates, as a result of participation in EFNEP, intake levels for each nutrient increased. There were also substantial improvements in the intake of food to meet the recommendations of the Food Guide Pyramid. At entry, only 18.1% of the 82,709 participants measured, had a diet that provided even half the recommended number of servings of breads and cereals and at least one serving from each of the other food groups. At exit, 44.5% of the participants had achieved this minimal level of intake. Ninety-two percent (92%) showed positive change in at least one food group at exit. Report provides additional statistical data from fiscal year 2000.

F16. Wells Willis. Do Diets & Effectiveness of Nutrition Education Programs Vary by Race and Ethnicity? Presented at the Society for Nutrition Education Conference, San Francisco, CA, July, 2000

When measured in comparison to the Food Guide Pyramid, do diets of various ethnic groups vary? Using data from the EFNEP Evaluation/ Reporting System from 1999, data on food intakes and effectiveness of nutrition were compared for the 5 major racial/ethnic groups: Whites (W), Blacks (B), Native Americans (N), Hispanics (H) and Asian/Pacific Islanders (A). [Data reported here were from 28 states with 115,000 program participants.] Data were collected using a 24-hour recall at entry into and exit from the program, and a 10 question behavior checklist. 41% of A were receiving WIC, compared to 58 % of H. Food Stamp participation varied from 36 – 39 % for H and W to 49 – 54 % for A and B. At entry into EFNEP, N had the lowest intakes of fruits (0.7), while A had the highest level (1.5), and the other groups ranged from 0.9 – 1.2. H had the lowest vegetable intakes (1.6) while A had the highest (2.7) and the rest had 2.1 – 2.2 servings. Calcium/dairy servings also varied, with A and B having .7 - .8 servings, W having 1.4 servings and the other groups having approximately 1 serving. Meat intakes were the most consistent across all groups, with 1.7 – 2.2 servings on average. Effectiveness of EFNEP was relatively consistent across all groups. The % with a positive change in any food group varied between 91 – 95 % for all races. A diet that provided at least one serving of each food group and 3 servings of Breads/Cereals meets a minimal measure of variety. At exit from EFNEP, >33% of all participants met this criteria, and for H and A, >50% achieved this goal. Intakes of fiber, calcium, Vitamin A, and Vitamin B₆ were higher at exit than entry for all groups. For behavior changes, all groups had 80 – 82 % improving 1 or more Food Resource Management Practices, 86 – 89 % improved 1+ Nutrition Practices and 61- 69 % improved 1+ Food Safety Practices. USDA funds EFNEP in 56 states/territories.

F17. Sylvia Montgomery & Wells Willis. EFNEP - Southern Region Summary.
<http://www.csrees.usda.gov/nea/food/efnep/pdf/99-sregion.pdf>, May 2000

In the Southern region in FY99, 61% of the participants completed the program, 14% terminated, and 25% are continuing into the next program year. Of the 14% who terminated the program, the majority of them (20%) had to terminate due to a move. Of the graduates who completed the program, 12% completed 1 through 6 lessons in three months or less; 4% completed the same number of lessons between 4 and 6 months. Twenty-six percent of the graduates completed anywhere from seven to twelve lessons in three months or less; 10% completed the same number of lessons between 4 and 6 months. Figure 1 depicts the number of lessons completed for graduates. The average number of lessons completed was 10.7. Additional impact data of the Southern region during the fiscal year 1999 is also highlighted.

F18. Sylvia Montgomery & Wells Willis. EFNEP - North East Region Summary.
<http://www.csrees.usda.gov/nea/food/efnep/pdf/99-neregion.pdf>, May 2000

In the North East region in FY99, 56% of the participants completed the program, 18% terminated, and 26% are continuing into the next program year. Of the 18% who terminated the program, the majority of them (22%) had to terminate due to a move. Of the graduates who completed the program, 22% completed 1 through 6 lessons in three months or less; 5% completed the same number of lessons between 4 and 6 months. Thirty-five percent of the graduates completed anywhere from seven to twelve lessons in three months or less; 10% completed the same number of lessons between 4 and 6 months. Figure 1 depicts the number of lessons completed for graduates. The average number of lessons completed was 8.8. Additional impact data of the North East region during the fiscal year 1999 is also highlighted

F19. Sylvia Montgomery & Wells Willis. Western Region Summary.
<http://www.csrees.usda.gov/nea/food/efnep/pdf/99-wregion.pdf>, April 2000

In the Western region in FY99, 73% of the participants completed the program, 15% terminated, and 12% are continuing into the next program year. Of the ones who terminated the program, 24% had to terminate due to a move, 32% had other obligations. Of the graduates who completed the program, 36% completed 1 through 6 lessons in three months or less; 2% completed the same number of lessons between 4 and 6 months. Thirty-nine percent of the graduates completed anywhere from seven to twelve lessons in three months or less; 7% completed the same number of lessons between 4 and 6 months. The average

behavior necessary for nutritionally sound number of lessons completed was 7.7. Additional impact data of the Western region during the fiscal year 1999 is also highlighted.

F20. Sylvia Montgomery & Wells Willis. EFNEP- North Central Region Summary.
<http://www.csrees.usda.gov/nea/food/efnep/pdf/99-ncregion.pdf>, April 2000

In the North Central region in FY99, 59% of the participants completed the program, 18% terminated, and 22% are continuing into the next program year. Of the 18% who terminated the program, the majority of them (27%) had to terminate due to a move. Of the graduates who completed the program, 28% completed 1 through 6 lessons in three months or less; 4% completed the same number of lessons between 4 and 6 months. Thirty-four percent of the graduates completed anywhere from seven to lessons in three months or less; 10% completed the same number of lessons between 4 and 6 months. Figure 1 depicts the number of lessons

completed for graduates. The average number of lessons completed was 8.7. Additional impact data of the North Central region during the fiscal year 1999 is also highlighted.

F21. Sylvia Montgomery & Wells Willis. Cooperative State Research, Education, and Extension Service EFNEP Youth. <http://www.csrees.usda.gov/nea/food/efnep/pdf/99youth.pdf>, March 2000

Who Are EFNEP Youth? Many EFNEP youth are from families enrolled in the adult program; many EFNEP youth are responsible for preparing their own meals and snacks at home without adult supervision; 53% of EFNEP youth are from rural areas. How Is EFNEP Delivered? The delivery of EFNEP youth programs takes on various forms. EFNEP provides education at schools as an enrichment of the curriculum, in after-school care programs, through 4-H EFNEP clubs, day camps, residential camps, community centers, neighborhood groups, and home gardening workshops. See Figure 3. In addition to lessons on nutrition, food preparation and food safety, youth topics may also include fitness, avoidance of substance abuse, and other health related topics. In FY99, there were a total of 16,743 EFNEP youth groups, 106,492 youth group meetings, and 219,140 contact hours with the youth were made by volunteers. The document highlights additional youth impact of the program during the fiscal year of 1999.

F22. Sylvia Montgomery & Wells Willis. Cooperative State, Research, Education, and Extension Service - EFNEP - Expanded Food and Nutrition Education Program.

<http://www.csrees.usda.gov/nea/food/efnep/pdf/99facts.pdf>, February 2000

Who Are EFNEP Families? 76% of EFNEP families are enrolled in one or more food assistance programs; 36% of the enrolled families have income at or below 50% of the poverty level. How Is EFNEP Taught? EFNEP is delivered as a series of lessons, often over several months, by paraprofessionals and volunteers, many of whom are indigenous to the target population. The hands-on, learn-by-doing approach allows the participants to gain the practical skills necessary to make positive behavior changes. In 1999, 2,698 paraprofessionals along with 41,138 volunteers delivered an average of 10 lessons to EFNEP participants with 62% of them completing the program, and 23% continuing the program in the year 2000. Through EFNEP, participants learn self-worth – that they have something to offer their families and society. How Are Accomplishments Measured? Data from the EFNEP Evaluation/Reporting System is used to measure food practice improvement and dietary improvements. Ten key food-related practices were measured at entry into EFNEP and upon graduation. These behavior changes translate into significant improvements in daily living skills. Two-page factsheet highlights the impact of the adult participants of the Expanded Food and Nutrition Education Program during the fiscal year FY1999.

F23. Wells Willis, Michael Lambur, Ruby Cox, Radhika Rajgopal, Edwin Lewis. Symposia: Use of Cost-Benefit Analysis (CBA) in Nutrition Education Programs. Presented at the Society for Nutrition Education Conference, 1999

Presentations covered the importance of cost-benefit documentation in the field of nutrition education; requirements for a program to be submitted to CBA; procedures involved in doing a CBA of nutrition education programs; considerations, assumptions, approach and results in determining the benefit to cost ratio of the Expanded Food and Nutrition Education Program (EFNEP); The applicability of this approach to other states' EFNEP and other nutrition education programs.

F24. Jean Anliker, Wells Willis, Sylvia Montgomery. The Development and Testing of the Behavior Checklist Questions for the EFNEP Evaluation/Reporting System, <http://www.csrees.usda.gov/nea/food/efnep/ers/documentation/checklist-development.pdf>, 1998

The validity, reliability, overall purpose and goals of the behavior checklist and the steps undertaken in the development of the original 13-item checklist are described, including the multiple tests and assessments that led to the final version. After 3 years, the use rate by states had increased from 60% to 80%, representing an increase from 29 to 41 states. Utilizing the data from the aggregated reports, a reassessment was conducted which lead to a refinement of the instrument into a 10-question checklist.

F25. United States Department of Agriculture/Extension Service, “EFNEP, Impact and Accomplishments”, 1994

The Expanded Food and Nutrition Education Program is designed to assist limited resource families and youth in acquiring the knowledge, skills, attitudes, and changed behavior necessary for nutritionally sound diets, and to contribute to their personal development and the improvement of the total family diet and nutritional well-being. This book gives a brief history of EFNEP; describes EFNEP clientele; and discusses the teachers (paraprofessionals and volunteers), the cooperative effort, program delivery and impact, etc.

Section II

State Published Studies²

This section of the bibliography contains 83 published studies conducted by the land-grant institutions. They are organized by state in order of most recent.

CALIFORNIA

CA1. Horowitz M, Shilts M, Lamp C, Townsend MS. A standards-driven evaluation of academic performance: an 8-step process for nutrition educators J Nutrition Education & Behavior. In press (anticipate Sept 2008 issue).

Providing nutrition education instruction in schools is becoming increasingly difficult because of increased emphasis on the preparation of students for standardized testing.¹ Higher priority core subjects often push out even the shortest of nutrition lessons. Nutrition educators will need to work with the current school priorities. This can be accomplished by aligning academic content standards with the nutrition education curriculum, evaluating academic performance,² and then preparing promotional materials for school administrators and wellness committee members.³ Although many nutrition educators feel comfortable developing, evaluating, and promoting the nutrition benefits of their curricula, doing the same with academic content standards may be a new concept. This GEM outlines an 8-step process that can be used to document achievement of academic content standards. This process could be used with any curriculum. References to specific materials in this article are meant as examples. Documenting and promoting standards achievement may be the key to survival of nutrition education programs in schools.²

CA2. Shilts M, Lamp C, Horowitz M, Townsend MS. Pilot study: Eatfit Improves 6th Graders' Performance on Standardized Math and English Tests. J Nutrition Education & Behavior In press (anticipate Sept 2008 issue).

Objective: Investigate the impact of a nutrition education program on student academic performance as measured by achievement of education standards. Design: One group treatment controlled study. Setting: California Central Valley suburban elementary school (58% qualified for free or reduced priced lunch). Participants: All sixth grade students in the elementary school clustered in three classrooms. Intervention: 9-lesson intervention with an emphasis on guided goal setting and driven by the Social Cognitive Theory. Outcome measure: Multiple choice survey assessing five education standards for 6th grade mathematics and English at three time points: baseline (T₁), 5 weeks (T₂) and 10 weeks (T₃). Analysis: Repeated measures, paired t-test and ANCOVA. Results: Changes in total scores were statistically different ($p \leq .05$) with treatment scores (T₃ - T₂) generating more gains. The change scores for one English ($p \leq .01$) and two mathematics standards ($p \leq .05$; $p < .0001$) were statistically greater for the treatment period (T₃ - T₂) compared to the control period (T₂ - T₁). Conclusion and Implications: Using standardized tests, results of this pilot study suggest that our behaviorally-focused nutrition education program can impact academic performance measured by achievement of specific mathematics and English education standards. Nutrition educators can show school administrators and wellness committee

²Studies in this section were conducted at the state level. Funding sources for the studies vary, therefore, only states whose studies have been published have been recognized. As future studies are conducted, this document will be appropriately amended to include them.

members that this program can positively impact academic performance, concomitant to its primary objective promoting healthful eating and physical activity.

CA3. Shilts M, Smith D, Ontai L, Townsend MS. Evidence to support the use of the retrospective pretest method to measure dietary behavior and self-efficacy in adolescents. *Journal of Youth Development*. In press (anticipate Summer 2008 issue).

This study compared the retrospective pretest-posttest method to the traditional prospective pretest-posttest method assessing adolescents' dietary and physical activity, self-efficacy and behaviors. Participants were 7th and 8th grade students at a rural K-8th grade elementary school in Northern California (n=188). All participants completed an evaluation instrument (traditional pretest), followed by a 9-lesson dietary and physical activity intervention. Upon completion of the intervention, participants completed a second and identical evaluation instrument which served as a traditional posttest. The following day, participants completed another evaluation tool, this time formatted as a retrospective pretest. Analysis included sample *t* tests comparing the means of each method. Participants (n = 154) with a mean age of 13 ± .7 years old were included in the analyses (52% female). Paired sample *t* tests reported non-significant differences between the two methods for dietary behavior and dietary self-efficacy, yet significant differences were found for physical activity behavior ($p < .05$) and physical activity self-efficacy ($p < .01$). We conclude that the retrospective pretest-posttest method was as good a measure of dietary self-efficacy and behavior as the traditional prospective pretest-posttest method and may be better at attenuating response-shift bias when assessing physical activity self-efficacy and behavior.

CA4. Townsend MS, Sylva K, Martin A, Metz D, Wooten Swanson P. Improving readability of an evaluation tool for low-income clients using visual information processing theories. *J Nutrition Education Behavior* 2008; 40:181-186.

Literacy is an issue for many low-income audiences. Using visual information processing theories, the goal was improving readability of a food behavior checklist and ultimately improving its ability to accurately capture existing changes in dietary behaviors. Using group interviews, low-income clients (n=18) evaluated 4 visual styles. The text plus color photographs style was preferred over the other 3 visual styles: text only, text plus black and white line drawings, and text plus gray-scale photographs. Employing cognitive interviewing in an iterative process, clients (n=25) recommended simplifying text for 10 items, modifying content for 15 or 16 visuals, and replacing text with visual content for 7 of 16 items. Professional staff (n=7) and educators (n=10) verified that visuals and revised text accurately reflected the content of each item. Clients reported that the revised checklist of the behaviors in question, and facilitated comprehension of text. Readability scores improved by more than 2 grades. This process can be duplicated by others interested in enhancing the quality of existing evaluation tools.

CA5. Crawford PB, Lamp C, Nicholson Y, Krathwohl S, Townsend MS. Food insecurity may be linked to childhood obesity in low-income Mexican- American families. *California Agriculture* 2007; 61(3):106-111.

The purpose of this study was to examine the associations between past and current maternal food insecurity and child-feeding practices among low-income Mexican-American families. Participants in the study were mother-child pairs enrolled in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). The findings suggest that low-

income Mexican-American mothers who are currently experiencing food insecurity were more likely to worry that their children were eating too much food and tended to offer smaller portion sizes to their children than mothers not currently experiencing food insecurity. Mothers who were overweight were more than twice as likely to have overweight children than mothers who were not overweight.

CA6. Townsend MS, Kaiser LL. Brief psychosocial fruit and vegetable tool is sensitive for United States Department of Agriculture's nutrition education programs. *Journal American Dietetic Assoc.* 2007; 107:2120-2124

The usefulness of an evaluation instrument is dependent on its reliability, validity, and ability to capture change. The latter psychometric characteristic is particularly important, yet is often neglected. The purpose of this study was to assess the sensitivity of a psychosocial fruit and vegetable evaluation tool for use by two US Department of Agriculture community-based programs. As part of a prospective randomized controlled trial, a sample of limited- resource women (n=93), recruited from eight counties, provided dietary recalls, behavioral assessments, and psychosocial assessments. A randomly selected subsample was used for venipuncture (n=55). Sensitivity of the tool was estimated using serum carotenoids, selected micronutrients, fruit/vegetable servings, and fruit/vegetable behaviors. Controlling for energy intake at baseline and change in energy intake, the change scores for the tool were correlated with reported changes in fruit and vegetable behaviors ($r=0.28$, $P=0.01$), vitamin C ($r=0.25$, $P=0.02$), and the biomarker serum carotenoids ($r=0.31$, $P=0.02$). This systematic process yielded a moderately sensitive evaluation tool useful with a limited-resource audience participating in two US Department of Agriculture programs. This is the first study to estimate sensitivity of a psychosocial tool for a fruit and vegetable intervention.

CA7. Kuyper EM, Espinosa-Hall GB, Lamp CL, Martin AC, Metz DM, Smith D, Townsend MS, Kaiser LL. Development of a tool to assess past food insecurity of immigrant Latino mothers. *J Nutrition Education & Behavior* 2006; 38:378-382.

Objective: The purpose is to describe the development and validation of a tool to measure the degree of past food insecurity in an immigrant US population. Design: Focus group discussions and a structured interview. As a first step, focus group discussions were conducted among immigrant Latino mothers. Based on these discussions, an 8-item tool was developed and pilot-tested in a convenience sample of mothers. Setting: California. Participants: Twenty-two low-income Latino mothers with children, ages 4 to 5 years, in the focus groups and 85 low-income Latino and white mothers of young children in the structured interviews. Analyses: Constant comparative analysis, Cronbach α , Spearman correlations, Chi-square, and Kruskal-Wallis test. Results: Internal consistency of the remaining 7 items was good (Cronbach $\alpha = 0.84$). Evidence of convergent validity included significant correlations between past food insecurity and maternal education ($r = -0.45$, $p<.0001$), crowding in the mother's childhood household ($r = +0.30$, $p<.006$), and past food insufficiency ($r = +0.74$, $p<.0001$). Foreign-born Latino mothers reported significantly greater levels of past food insecurity than US-born mothers, demonstrating discriminant validity ($p<.01$). Conclusions and Implications: This tool may be useful to determine how past deprivation influences current food choices and other nutrition-related behaviors in low-income Latino immigrants.

CA8. Marilyn S. Townsend, Margaret Johns, Mical Kay Shilts, Lucrecia Farfan-Ramirez. Evaluation of a USDA Nutrition Education Program for Low-Income Youth. *Journal of Nutrition Education and Behavior*, 38(1):30-41, 2006

Objective: Examine effectiveness of a state's Youth Expanded Food and Nutrition Education Program (EFNEP) and assess the validity of the federal impact indicator method for reporting program outcomes. Design: A randomized, controlled field trial of 229 groups with 5,111 youth, 9-12 years old, in community settings. Intervention: 6- to 8- hour, 7-lesson education experience with food preparation and tasting, an education experience typical of EFNEP in California. Outcome Measures: U.S. Department of Agriculture (USDA) impact indicators: nutrition knowledge, eating a variety of foods, food selection, and food preparation and safety practices. Analysis: Analysis of covariance model controlling for pretest, gender, age, and ethnicity, with group nested in condition. Results: Organizing responses by impact indicators, treatment participants made significant gains on the posttest compared to controls for 3 of 4 indicators ($P < .008$ to $P < .0001$). Gains were made by 34 to 68% of youth participants for 4 indicators. The impact indicator method for federal reporting compared favorably with results from a randomized controlled trial with groups nested in conditions. Conclusion and Implications: This is the first report in the literature of (1) a large evaluation study of youth EFNEP and (2) an estimate of the validity of the USDA impact indicator method for reporting program outcomes.

CA9. Marilyn S. Townsend. Evaluating Food Stamp Nutrition Education: Process for Development and Validation of Evaluation Measures. *Journal of Nutrition Education and Behavior*, 38(1):18-24, 2006

The purpose of this paper is to describe a process for developing and validating outcome measures relevant to dietary quality behaviors targeted by Food Stamp Nutrition Education (FSNE). The ultimate goal is a measure that is valid, reliable, sensitive to change, and practical for use for a wide variety of FSNE evaluation purposes. The development process has incorporated input from FSNE stakeholders at the federal and state level and follows a systematic, research-driven approach that incorporates both qualitative and quantitative research and includes methods for identification of subject domains, selection of evaluation items, initial pretesting, and reduction of items. This type of research establishes the trustworthiness of new evaluation measures.

CA10. Marilyn S. Townsend. Obesity in Low-Income Communities: Prevalence, Effects, a Place to Begin. *Journal of the American Dietetic Association*, 106(1):34-37, 2006

What is different about the people living in these low-income communities or about the communities themselves that is contributing to the higher rates of obesity? With regard to diet, three potential differences come to mind. Drewnowski and Rolls hypothesize that the difference is mainly attributable to higher – energy-dense foods eaten by low-income consumers. Second, compared with middle-income communities, food insecurity plagues many low-income communities, and food insecurity has been shown to be positively associated with overweight among women. Third, the majority of food stamp recipients live in low-income communities. Preliminary research has found a positive relationship between women's Food Stamp Program participation and their body weight.

CA11. M. L. Blackburn, M. S. Townsend, L. L. Kaiser, A. A. Martin, E. A. West, B. Turner, A. B. Joy. Food Behavior Checklist Effectively Evaluates Nutrition Education. *California Agriculture*, 60(1):20-24, 2006

A short food behavior checklist (FBC) was developed to evaluate the impact of nutrition education on fruit and vegetable intake among ethnically diverse women in the Food Stamp Nutrition Education Program (FSNEP) and the Expanded Food and Nutrition Education Program (EFNEP). To validate the FBC, interviewers collected three 24-hour dietary recalls as well as responses to 11 FBC behavioral questions about fruits and vegetables from 100 English-speaking, low-income women at baseline. A randomly selected subgroup (n=59) provided a blood sample for analysis of total serum carotenoids at baseline and follow-up. After 6 hours of nutrition education, the treatment group reported significant improvements in three of the seven FBC questions related to fruit and vegetable intake, while no significant changes occurred in the control group. All seven FBC questions were significantly correlated with total serum carotenoids. This short, culturally neutral FBC is a valid and reliable indicator of fruit and vegetable consumption. Compared with the 24-hour dietary recall, it is also less time-consuming to administer, code and analyze, with a reduced respondent burden.

CA12. Marilyn Townsend, Lucia Kaiser. Development of a Tool to Assess Psychosocial Indicators of Fruit and Vegetable Intake for 2 Federal Programs. *Journal of Nutrition Education and Behavior*, 37(4):170-184, 2005

Objective: Development of an evaluation tool of psychosocial constructs for use by participants in 2 federal programs, Food Stamp Nutrition Education and the Expanded Food and Nutrition Education Program. Design: Cross-sectional data from a longitudinal study. Participants: Limited-resource women (n=111) living in low-income communities. Measures: Test-retest reliability, internal consistency, ethnic differences, convergent validity. Analysis: Spearman rank order correlation, analysis of variance, principal components analysis. Results: Reliability coefficients ranged from a low of $r = .18$ (not significant) to $r = .74$ ($P < .0001$). Two items were deleted for not meeting criteria for reliability and 2 for redundancy. Ethnic differences at baseline were significant for 1 item. Domain constructs loaded on 4 to 5 factors for the biopsychosocial framework. Estimates of convergent validity of 9 constructs led to the deletion of 3 (i.e., perceived barriers, social support, and perceived norms), with retention of perceived benefits, perceived control, self-efficacy, readiness to eat more fruit, readiness to eat more vegetables, and perceived diet quality. As an estimate of convergent validity, the final version of the tool with 6 constructs remaining showed significant correlations with indicators of

diet quality: serum carotenoid values ($r = .38$, $P < .001$); hypothesized nutrients calculated from the mean of three 24-hour dietary recalls (vitamin C, $r = .47$, $P < .0001$; vitamin A, $r = .39$, $P < .0001$; folate $r = .37$, $P < .0001$; betacarotene, $r = .31$, $P < .001$; and fiber, $r = .46$, $P < .0001$); fruit and vegetable servings ($r = 0.55$, $P < .0001$); Healthy Eating Index ($r = .27$, $P < .05$); and a fruit and vegetable behavioral scale ($r = .60$, $P < .0001$). Conclusion and Implications: This systematic process yielded a fruit and vegetable evaluation tool useful for practitioners and researchers. This is the first validation study of this type to estimate convergent validity with 5 indicators of diet quality, including a biomarker.

CA13. Karrie Heneman, Amy Block-Joy, Sheri Zidenberg-Cherr, Susan Donohue, Linda Garcia, Anna Martin, Diane Metz, Dorothy Smith, Estella West, Francene M. Steinberg. A “Contract for Change” Increases Produce Consumption in Low-Income Women: A Pilot Study. *Journal of the American Dietetic Association*, 105(11):1793-1796, 2005

This study determined whether a “Contract for Change” goal-setting exercise enhanced the effectiveness of the Expanded Food and Nutrition Education/Food Stamp Nutrition Education programs to increase produce consumption in low-income ($<130\%$ of poverty) women after 4 weeks. Thirty-eight participants were randomized in this three-group parallel arm study: (a) control group participants received life-skills lessons, (b) the education group received the Expanded Food and Nutrition Education/Food Stamp Nutrition Education “Food Guide Pyramid” lessons, and c) the contract group also received the “Food Guide Pyramid” series and completed a “Contract for Change.” It was hypothesized that the contract group would have the greatest increases in advancement toward dietary change and produce consumption. Compared with controls, the contract group significantly moved toward acceptance of vegetable consumption ($P < .05$). Compared with the education group, the contract group significantly increased fruit consumption. Results suggest that nutrition professionals can effectively use goal-setting to assist low-income populations with dietary change.

CA14. Marcel Horowitz, Mical K. Shilts, Marilyn Townsend. Adapting a Diet Analysis Program for an Adolescent Audience. *Journal of Nutrition Education and Behavior*, 37:43-44, 2005

Lytle and Achterberg identified key components to behavior change for youth interventions: (1) self-assessment of eating patterns for adolescents, (2) use of interactive computer technology, and (3) personalized and targeted messages. Building on this literature and our interviews with individual middle school students and teachers in California, we decided to include a focused computer component as an important strategy for a nutrition education intervention. The cost of developing a computerized diet analysis application was prohibitive ($> \$100,000$). As a viable alternative, saving time and money, we decided to adapt an existing computer application to meet the needs of our new audience. This adapted Web-based application (www.eatfit.net) starts with the entry of a 24-hour diet record by the adolescent and concludes with the output of a personalized and behaviorally focused goal. Although we believed that our plan was comprehensive, we learned otherwise. This GEM delineates the 6 steps we took to adapt this application. We offer supporting examples from our experiences. These steps might assist others who are considering the inclusion of a computerized diet analysis application into their nutrition education efforts.

CA15. L. L. Kaiser, M. S. Townsend, H. R. Meglar – Quinonez, M. L. Fujuu, P. B. Crawford
Choice of Instrument Influences Relations Between Food Insecurity and Obesity in Latino
Women. *American Journal of Clinical Nutrition*, 80:1372-1378, 2004

Background: The results of studies examining food insecurity and obesity in adults are conflicting. Discrepancies could be due to the use of different instruments or to cultural factors that influence response patterns. Objective: The goal was to examine the relation of food insecurity to weight status in low-income Latino women. Design: A cross-sectional survey was conducted among 559 low-income Latino women selected by convenience sampling. The survey included the 18-item U.S. Household Food Security Scale, 2 items related to current and past food insufficiency, demographic information, and measured heights and weights. Data were collected between February and May 2001 in 6 California counties. The main outcomes were frequency of overweight and obesity, defined by a body mass index (in kg/m²) of 25.0-29.9 (overweight) and >30 (obese). Data analysis included analysis of variance, Mantel-Haenszel chi-square test, and logistic regression. Results: The prevalence of food insecurity was 50-60%, and that of obesity was 37.4%. Controlling for years spent in the United States, per capita income, and parity, food insecurity with hunger, measured by the 10-item adult scale of the Food Security Scale, was significantly related to obesity (OR: 1.98; 95% CI: 1.14,3.53). No interaction between years spent in the United States and current food insecurity was observed. Current food insufficiency, as measured by a single item, was not related to obesity. However, severe past food insufficiency was related to obesity in the U.S.-born population only. Conclusion: Food insecurity appears to be related to obesity in Latino women, but choice of instruments might influence the results.

CA16. P. Crawford, M. S. Townsend, D. L. Metz, D. Smith, G. Espinosa – Hall, S. S. Donohue, B. Sutherland, A. Olivares, L. L. Kaiser. How Can Californians Be Overweight and Hungry?
California Agriculture, 58(1):12-17, 2004

The United States is experiencing an epidemic of obesity in both adults and children, particularly among low-income populations. In fact, overweight has replaced malnutrition as the most prevalent nutritional problem among the poor. We examine this seemingly paradoxical relationship and explore the causes and consequences of overweight, obesity and food insecurity. In a UC Cooperative Extension Body Weight and Health Workgroup study of 561 low-income Latino mothers and their young children, we found important differences in the association between family food insecurity and overweight status for mothers and their children. Forty percent of the women were overweight and 37% obese, and 22% of their children were overweight. Furthermore, U.S. born mothers who were food insecure as children were more likely to be obese adults. Awareness and understanding of the link between food insecurity and weight gain will facilitate the efforts of schools, food assistance programs, the food industry and others in the community to provide effective nutritional programs.

CA17. Marcel Horowitz, Mical K. Shilts, Marilyn S. Townsend. EatFit: A Goal-Oriented Intervention that Challenges Adolescents to Improve Their Eating and Fitness Choices. *Journal of Nutrition Education and Behavior*; 36:43-44, 2004

Surveys show that many young people do not engage in the recommended levels of physical activity, nor do they have diets meeting the U.S. Dietary Guidelines. These health behaviors contribute to obesity, now at an all-time high among adolescents. With this in mind, we developed “EatFit” to improve the dietary and physical activity behaviors of middle school

students. EatFit is a goal-oriented intervention designed to challenge middle school students to improve their eating and fitness choices. Applying the Social Cognitive Theory, this educational intervention uses computer technology to assist adolescents with diet assessment and “guided” goal setting for making health life-style choices. The nine-lesson program delivered by middle school teachers provides skill building experiences and social support to promote dietary self-efficacy and goal attainment. It is appropriate for after school programs, 4-H youth development programs, EFNEP, FSNEP, students schooled at home, and other youth programs.

CA18. Mical K. Shilts, Marcel Horowitz, Marilyn Townsend. Goal Setting as a Strategy for Dietary and Physical Activity Behavior change: A Review of the Literature. *American Journal of Health Promotion*, 19(2):81-93, 2004

Objective: Estimate effectiveness of goal setting for nutrition and physical activity behavior change, review the effect of goal-setting characteristics on behavior change, and investigate effectiveness of interventions containing goal setting. Data source: For this review, a literature search was conducted for the period January 1977 through December 2003 that included a Current Contents, Biosis Previews, Medline, PubMed, PsycINFO, and ERIC search of databases and a reference list search. Key words were goal, goal setting, nutrition, diet, dietary, physical activity, exercise, behavior change, interventions, and fitness. Study inclusion and exclusion criteria: The search identified 144 studies, of which 28 met inclusion criteria for being published in a peer reviewed journal and using goal setting in an intervention to modify dietary or physical activity behaviors.

CA19. Mical K. Shilts, Marcel Horowitz, Marilyn Townsend. An Innovative Approach to Goal Setting for Adolescents: Guided Goal Setting. *Journal of Education and Behavior*, 36:155-156, 2004

Goal setting has shown promise in promoting positive behavior change in the nutrition and physical activity fields.

When designing the goal-setting strategy for an intervention, a decision about goal type (who develops and chooses the goal) has to be made. Several factors, such as participant’s age, intervention setting, and readiness to change, influence the type of goal to use: (1) self-set, (2) participatory, or (3) assigned. This GEM is about the development and use of a fourth type, guided goal setting. This GEM (1) describes the development of the guided goal-setting strategy, (2) shows how guided goal setting was implemented in the EatFit intervention, and (3) provides a step-by-step guide for the practitioner who wishes to duplicate the guided goal-setting strategy.

CA20. Lucia Kaiser, Hugo Melgar-Quinonez, Marilyn Townsend, Yvonne Nicholson, Mary L. Jujii, Anna Martin, Cathi Lamp. Food Insecurity and Food Supplies in Latino Households with Young Children. *Journal of Nutrition Education and Behavior*, 35(3):148-153, 2003

Objective: To examine the relationship between food insecurity and food supplies Latino households. Design: Cross-sectional survey, conducted February to May 2001. Setting: Six California counties. Participants: Convenience sampling was used to recruit 274 low-income Latino families with preschool children from the Special Supplemental Nutrition Program for Women, Infants and Children (WIC), Head Start, and other community-based organizations. Complete data were available for 256 families. Variables Measured: Food security, household food scores. Analysis: Pearson correlations, Kruskal-Wallis test, and logistics regression.

Significance level at $P < .05$. Results: Controlling for maternal education, food insecurity over the past 3 months was associated with lower household food supplies: dairy, $r = -.18$, $P < .01$; fruit, $r = .36$, $P < .001$; grains, $r = -.27$, $P < .0001$; meats, $r = .22$, $P < .001$; snack foods, $r = .23$, $P < .001$; and vegetables, $r = -.29$, $P < .001$. Conclusions and implications: In Latino households, greater food insecurity is associated with a lower variety of most foods, particularly fruits and vegetables. Future research in Latino households should explore the effects of seasonal food insecurity and household food shortages on food intake of individual household members, especially young children.

CA21. Marilyn S. Townsend, Lucia L. Kaiser, Lindsay H. Allen, Amy Block-Joy, Suzanne P. Murphy. Selecting Items for a Food Behavior Checklist for a Limited-Resource Audience. *Journal of Nutrition Education and Behavior*, 35(2):69-82, 2003

Objective: To report 6 psychometric properties of food behavior checklist (FBC) items and then to use these properties to systematically reduce the number of items on this evaluation tool. Design: Random assignment to the intervention and control groups. Setting: Low-income communities. Participants: Women ($N = 132$) from limited-resource families. Main Outcome Measures: Reliability, internal consistency, baseline differences by ethnicity, sensitivity to change, and criterion and convergent validity of subscales. Results: The fruit and vegetable subscale showed a significant correlation with serum carotenoid values ($r = .44$, $P < .001$), indicating acceptable criterion validity. Milk, fat/cholesterol, diet quality, food security, and fruit/vegetable subscales showed significant correlations with dietary variables. Nineteen items have acceptable reliability. Twenty items showed no baseline differences by ethnic group. Eleven of the 15 items expected to show change following the intervention demonstrated sensitivity to change. Conclusions and Implications: This brief food behavior checklist (16 items) is easy to administer to a client group, has an elementary reading level (fourth grade), and has a low respondent burden in addition to meeting requirements for validity, reliability, and sensitivity to change. This study establishes a process that can be used by other researchers to develop and further refine instruments for use in community health promotion interventions.

CA22. Townsend MS, Nitzke S, Contento I, McClelland J, Keenan D, Brown G. Using a theory driven approach to design a professional development workshop. *J Nutrition Education & Behavior*. 2003;35:312-318. This study reflects an FNEE workshop that included many EFNEP and FSNE coordinators and staff.

The objective of this study was to show how a theory driven approach to program planning was used to design and evaluate a professional development workshop. Our method was to demonstrate modeling of theory use as a teaching strategy. The Theory of Planned Behavior was used to structure all components of a 6-hour workshop. This workshop significantly increased participants' intention to use theory in designing programs ($P < .0001$). Educators can apply the methods demonstrated here to systematically use theory in the development, implementation, and evaluation of their workshops, staff trainings, and curricular materials for professionals and consumers.

CA23. Mical K. Shilts, Marilyn Townsend, Marcel Horowitz. Pilot Study of the EatFit Intervention to Determine Sample Size and Protocol for a Randomized Controlled Trial. *Focus on Cancer prevention Research Brief*, November 2002(2), 2002

Research suggests that goal-setting can promote health behavior change. The use of goal setting as a major component of nutrition and physical activity interventions has the potential to be an important facilitator of behavior change. Setting specific goals provides a strategy for organizing nutrition and physical activity information and skills into practical and manageable steps. Using this strategy, the EatFit intervention was developed. Although goal setting has been shown to promote dietary and physical activity behavior change among adults, it has not been adequately investigated with middle school aged adolescents.

CA24. Suzanne Murphy, Lucia Kaiser, Marilyn Townsend, Lindsay Allen. Evaluation of Validity of Items for a Food Behavior Checklist. *Journal of the American Dietetic Association*, 101(7):751-756,761; 2001

Objectives: To evaluate the validity of food behavior items, using a biological measure (serum carotenoids) as the criterion for validity of fruit and vegetable intake, and the results from multiple 24-hour recalls to test convergent validity with nutrient intake. Design: Participants responded to 39 food behavior questions and later completed three 1-day dietary recalls. Serum carotenoid levels were determined for a 59% randomly selected subsample. Subjects/setting: A convenience sample of 100 English-speaking, low-income women participating in a Food Stamp Nutrition Education Program in 8 California counties. Statistical Analyses. Spearman correlation coefficients were calculated between responses to the food behavior items and (a) serum carotenoid levels and (b) mean nutrient intakes from the 24-hour recalls. Cronbach's coefficient α was determined for items within broad food behavior topics. Results: Responses to 10 food behavior items were significantly correlated with serum carotenoid levels (correlations greater than 0.45 were found for choosing low-fat foods and a self-evaluation of overall dietary quality). An additional 12 items showed hypothesized associations with the 24-hour recall data (with a maximum correlation 0.50 for number of eggs per week and dietary cholesterol). Cronbach's coefficient α ranged from 0.28 (for 5 fat and cholesterol items) to 0.79 (for 9 fruit and vegetable items). Applications/Conclusions: Nutrition professionals can use these methods to validate items for food behavior checklists for specific populations. The items described here may be useful when designing instruments to administer to low-income women in a community setting.

CA25. Marilyn S. Townsend, Janet Peerson, Bradley Love, Cheryl Achterberg, Suzanne Murphy. Food Insecurity is Positively Related to Overweight in Women. *Journal of Nutrition*, 131:1738-1734; 2001

Although individuals with poor food security might be expected to have reduced food intake, and thus reduced body fat and less likelihood of being overweight, these associations have not been adequately studied. The purpose of the current study was to examine the relationship between food insecurity and overweight as measured by body mass index (BMI) using data from the nationally representative 1994 - 1996 Continuing Survey of Food Intakes by Individuals (CSFII). Overweight was defined as BMI $> 27.3 \text{ kg/m}^2$ for women and 27.8 kg/m^2 for men. Food insecurity was related to overweight status for women ($n=4509$, $P<0.0001$), but not for men ($n=4970$, $P=0.44$). Excluding the 11 severely insecure women, the prevalence of overweight among women increased as food insecurity increased, from 34% for those who were

food secure (n=3447), to 41% for those who were mildly food insecure (n=966) and to 52% for those who were moderately food insecure (n=86). Food insecurity remained a significant predictor of overweight status, after adjustment for potentially confounding demographic and lifestyle variables ($P<0.01$). In a logistic regression analysis, mildly insecure women were 30% more likely to be overweight than those who were food secure [odds ratio (OR) 1.3, $P=0.005$]. Thus, food insecurity had an unexpected and paradoxical association with overweight status among women with a higher prevalence of overweight among the food insecure, and a resulting potential for increased incidence of obesity-related chronic diseases. Given that the rates of both overweight and food insecurity are on the rise, this research area warrants further investigation.

CA26. Ikeda, J. P., Ceja, D. R., Glass, R. S., Hardwood, J. O., Lucke, K. A., Sutherlin, J. M. Food Habits of the Hmong Living in Central California. *Journal of Nutrition Education*, 23(4), 1991

In order to design more effective nutrition education programs for the over 50,000 Hmong who have immigrated to Central California from Southeast Asia, a study of their food habits was undertaken. Focus interviews were conducted with key informants working in the Hmong community. Using information from these interviews, two questionnaires were constructed to gather specific information on cultural food habits. Trained bilingual paraprofessionals administered the questionnaires, gathered demographic data, and took 24-hour food recalls from 205 volunteer, low-income Hmong homemakers about to be enrolled in the EFNEP Program in San Joaquin, Merced, and Fresno counties. Results of the study include a descriptive summary of eating patterns, staple foods, food preparation, familiar and unfamiliar foods, food procurement, food handling, perceptions and beliefs regarding body size and health, and expressed food and nutrition needs and interests. Computer nutrient analysis of the food recalls from non-pregnant subjects (N=142) revealed intakes of less than 80% of the 1989 RDA for riboflavin, calcium, iron, magnesium, and zinc. Pregnant subjects (N=63) had low intakes of these nutrients, as well as of vitamins B-6 and folacin.

CA27. Ann M. Del Tredici, Amy Block-Joy, Carol L. Omelich, Susan Laughlin. Evaluation Study of the California Expanded Food and Nutrition Education Program: 24-Hour Food Recall Data. *Journal of the American Dietetic Association*, 88(2):190-195, 1988

The California Expanded Food and Nutrition Education program (EFNEP) Evaluation Study evaluated the effectiveness of the California program. The eating habits of 683 persons were studied in a group receiving EFNEP instruction (355 participants) and a control group (328 participants) that received no instruction. The 24-hour food recall was used to assess eating habits using the Synectics method. At the beginning of the study, there were no differences in food recall scores between the EFNEP and the control groups. After 6 months of instruction in the EFNEP group, there was a significant increase in food recall score for that group and no change in the control group. The improvements observed in the EFNEP group resulted from increased intakes from the milk, protein, and fruit and vegetable food groups. The program characteristics that led to those changes were determined to be in the length of the EFNEP visit, the number of EFNEP visits, and the EFNEP instruction topics. These results show that the California EFNEP is effective in producing significant changes in the eating habits of the low-income individuals it serves.

CA28. Amy Block Joy, George Goldman, and Vijay Pradhan. Cost-benefit analysis conducted for nutrition education in California. *California Agriculture*, 60(4): 185-191, 2006
<http://repositories.cdlib.org/anrcs/californiaagriculture/v60/n4/p185>

Documenting the cost-effectiveness of nutrition education programs is important to justify and determine expenditures and ensure continued funding. A cost-benefit analysis was conducted using the program demographics and food-related dietary behavior of participants enrolled in California's Expanded Food and Nutrition Education Program (EFNEP), based on methodology developed by Virginia Cooperative Extension. The initial benefit-cost ratio for nutrition education in California was 14.67 to 1.00. Several sensitivity analyses were done to estimate the effect of changes in key variables. The resulting benefit-cost ratios ranged from 3.67 to 1.00, to 8.34 to 1.00, meaning that for every \$1.00 spent on nutrition education in California, between \$3.67 and \$8.34 is saved in health care costs. These results bolster the argument that nutrition education programs are a good investment and funding them is sound public policy.

COLORADO

CO1. Jennifer Anderson, Jamie Zoellner, Susan M. Gould. Comparative Validation of a Bilingual Interactive Multimedia Dietary Assessment Tool. *Journal of the American Dietetic Association*. 105(8):1206-1214; 2005

The objective was to perform comparative validity testing for a bilingual interactive multimedia (IMM) dietary assessment tool that mimics a dietary recall against an interview-administered dietary recall. This was a two-period crossover design study. First, participants were randomly assigned to complete an IMM recall or interview-administered 24-hour recall. The IMM recall generated a nutrient profile that included 20 dietary constituents. The interview-administered recall was analyzed using the Food Intake Analysis System (FIAS) and the Expanded Food and Nutrition Education Program Evaluating/Reporting System. The effect of substituting standardized portion sizes for reported portion sizes was examined.

CO2. Terry Taylor, Elana Serano. La Cocina Saludable - The Healthy Kitchen. Colorado State University, Cooperative Extension, 1995

This nutrition program was designed to teach nutrition to parents who are eligible for WIC benefits; Hispanics and migrant farm workers; EFNEP participants; and low-income households. The program was designed and researched using Abuelas (Hispanic grandmothers) as educators. Program contains 1 resource guide, 1 flip chart, 1 food pyramid model, 1 brochure, 1 apron, 2 measuring cups, 1 tote bag, 1 set of measuring spoons, 1 wooden spoon, and 1 plastic spatula.

CO3. Jennifer E. L. Anderson. EFNEP Evaluation in Colorado Using Simplified Progression Form. *Journal of Nutrition Education*. 20(5):227-231, 1988

The Expanded Food and Nutrition Education Program (EFNEP) is a food and nutrition education program tailored specifically to the needs of low-income consumers. The program is administered by the Extension Service of the United States Department of Agriculture (USDA), in cooperation with the land-grant universities and Cooperative Extension Service. State coordinators for EFNEP and food and nutrition extension specialists, based at the land-grant universities, provide training, develop program resources, and evaluate the program impact. The objectives of EFNEP are a) to help low-income families acquire the knowledge, skills, and

attitudes, and adopt behaviors necessary for nutritionally sound diets and b) to contribute to their personal development and to the improvement of the entire family's diet and nutritional well-being. To achieve these objectives, program delivery includes direct teaching by paraprofessionals or trained volunteers. Low-income homemakers are enrolled in individual or group teaching sessions. EFNEP also includes programs for low-income 4-H youth. The program policies define the expected outcomes, specifying the desired knowledge and practices that participants should achieve as a result of participation in EFNEP.

FLORIDA

FL1. David Wood . Effect of Child and Family Poverty on Child Health in the United States. *Pediatrics*, 112(3):707-711, 2003

Poverty has been described as an economic state that does not allow for the provision of basic family and child needs, such as adequate food, clothing, and housing. However, the debate about the effects of poverty on the growth, development, and health of children is as much involved with the culture or general context of poverty as it is with the economics of poverty. This culture of poverty is in part mediated through environmental deprivations, such as failing schools, gangs, drugs, violence, and struggling families. Hecló described this sociocultural and environmental dimension of poverty as "a condition of misery, hopelessness, and dependency." The subject of this article is to review the literature on the effects of poverty on US children as mediated through economic, ecologic, and family influences.

FL2. C. G. Davis. Impact of Food Stamp and Nutrition Education Programs on Food Group Expenditure and Nutrient Intake of Low Income Households. *Southern Journal of Agricultural Economics*, 11(2):121-129, 1979

The purpose of this article is to (1) identify selected food group and corresponding nutrient intake responses associated with participation in the Food Stamp Program (FSP) and Expanded Food and Nutrition Education Program (EFNEP), (2) simulate the nutritional impact of alternative policy mechanisms with joint FSP and EFNEP participation, and (3) explore policy implications for food and nutrition program planning.

GEORGIA

GA1. Brenda Schuler. EFNEP: Finding Ways to Reach People. *Food & Nutrition*, 14(2):6-9, 1984

A project that used mass media, films, printed materials and new educational methods to enhance the Expanded Food and Nutrition Education Program (EFNEP) services to low-income families in Georgia is described. Primary efforts focused on increasing participation through 5 recruitment tools: public service announcements on radio and television, direct mail materials, posters, and short films. The second phase focused on improving the effectiveness of nutrition education methods. Six teaching techniques were tested. As a result, an 8-part food and nutrition soap opera series, entitled *The Pitts*, was developed and broadcast on commercial television. However, results were mixed concerning the amount of learning that occurred. Tests of education methods show that 1-to-1 instruction is still the most effective teaching method. Group sessions also proved beneficial for those who attended and aides now use a time-saving 20-

lesson structured course as the basis for their teaching. Basic nutrition needs of food stamp families are mentioned along with findings of the effectiveness of EFNEP.

HAWAII

HI1. Joda Derrickson, Dian A. Gans. Assessment of Dietary Intake and Food-Related Behaviors of Gatekeepers in Homeless Families in Hawaii. *Journal of Nutrition Education*, 28(3):168-173, 1996

We assessed diet quality and documented food-related behaviors of gatekeepers in homeless families with children in Hawaii. The dietary intake of gatekeepers residing in shelters (n = 44) was compared to that of gatekeepers living at beach parks (n = 13). The gatekeepers completed a 24-hour diet recall and answered questions about demographics and food-related behaviors. Diets were low in fiber, calcium, and vitamin A, did not vary significantly with shelter status, and were consistent with the diets of Expanded Food and Nutrition Education Program (EFNEP) participants in Hawaii. We concluded that both homeless groups would benefit from educational efforts similar to those used with EFNEP clients, with a greater focus on food safety, alternate food resources, and appropriate cooking methods.

IDAHO

ID1. Martha Raidl, Shelly Johnson, Kali Gardiner, Marty Denham, Kris Spain, Rhea Lanting, Cammie Jayo, Audrey Liddil, Karen Barron. Use Retrospective Surveys to Obtain Complete Data Sets and Measure Impact in Extension Programs. *Journal of Extension*, 42(2), 2004

Demonstrating impact in Extension programs is necessary to maintain funding and ensure their continuation. Traditionally, pre/post surveys have been conducted to determine changes in participants' knowledge, behavior, attitude, or skills. However, evaluation with a pre/post format has two problems. The first is incomplete data sets, where either pre- or the post- only are filled out. The second problem is referred to as "response-shift bias", where participants overestimate their behaviors on the pre-survey and underestimate their behaviors on the post-survey due to a change in frame of reference. These problems can be circumvented by using a retrospective survey. Researchers have adapted retrospective surveys to determine changes in behavior of individuals in drug prevention and leadership development; changes in attitudes toward individuals with HIV/AIDS, and changes in knowledge from taking a nutrition course. In Idaho, the Food Stamp Nutrition Education (FSNE) program, called the Extension Nutrition Program (ENP), switched from having participants complete a traditional EFNEP survey that had a pre-post format, which measured self-reported changes in nutrition, food safety, and resource management behaviors to the retrospective survey. The purpose of the project reported here was to determine if a retrospective survey decreased the number of incomplete responses and provided an effective measure of self-reported changes in nutrition, food safety, and resource management behaviors.

ILLINOIS

IL1. Adedze P, Chapman-Novakofski K, Witz K, Orr R, Donovan SM. (2006). Knowledge, Attitudes and Beliefs about Nutrition and Childhood Overweight among WIC Participants. JNEB 38(4): S61

Overweight has become the most prevalent public health concern among children and adolescents in the United States. Approximately 10 percent of preschoolers aged 2-5 are overweight and low-income, minority children are at higher risk. **PURPOSE:** To assess knowledge, attitudes and beliefs about nutrition, physical activity, health risks related to childhood overweight among WIC participants. Theoretical framework is based on Social Ecological Model. **METHODS:** Self-administered questionnaire consisting of 40 questions was developed and tested. A convenience sample of 166 WIC participants completed the survey and signed consent forms. Chi square test performed using SPSS. **RESULTS:** 90% of participants were knowledgeable about causes and health risks of overweight. Response to the belief that “some people are born big or thin there is nothing to do to change it” varied by ethnicity and education level. Among those <12 years of education, 54% of Caucasians ($P > .05$) and 70.6% of African Americans agreed with the statement ($P < .05$). With regard to activity, 53.5% of Caucasians reported their children spend 2-3 hours/day watching TV and playing video games and 9.9% reported 4 hours or more. Children of African American parents were more sedentary; 69% reported 2-3 hours and 21.4% reported 4 or more hours/day ($P < .05$). **CONCLUSION:** Participants displayed a high level of nutrition knowledge, however, beliefs related to the risk of overweight and activity level of the children differed among ethnic groups. Thus, nutrition education on childhood overweight must take into account the ethnicity and education level of parents.

IL2. Adedze P, Witz K, Orr R, Donovan SM. (2007). Evaluation of the Healthy Moves for Healthy Children Program: Focus Groups with Head Start Teachers. JNEB 39(4): S117

Childcare providers are key partners in prevention of childhood overweight. The Healthy Moves for Healthy Children (HMHC) curriculum was adapted from Iowa State Extension “Pick a Better Snack” program by University of Illinois Extension. In 2005, Head Start teachers received HMHC in-service training and were provided with a set of 4x6-inch cards, with thematic suggestions for healthy snacks, physical activities and children’s books, to implement throughout the year. **PURPOSE:** To conduct a qualitative assessment of the benefits of the HMHC program and suggestions for program improvement. **METHODS:** Two focus groups were conducted with Head Start teachers (n=14) in Decatur, IL, by an experienced moderator using predetermined questions. Responses were audio taped, transcribed and key themes identified. **RESULTS:** Teachers perceived the HMHC curriculum as an important source of new ideas that was convenient and easy to use. Specific benefits included linking healthy snacks with activities, and having the cards bound together. Suggestions for improvement included larger format cards, more frequent hands-on training, and providing more options for age-appropriate activities and low-cost snacks that do not require cooking. Teachers desired greater control of nutrition curricular decisions and opportunities to use the HMHC curriculum. Teachers also requested HMHC resources for educating parents. **CONCLUSIONS:** Head Start teachers believed that they can play a role in obesity prevention through nutrition education and valued the HMHC curriculum as a resource. Areas for program improvement and the need for consistent nutrition education messages between parents and teachers were also identified.

IL3. Martha Poolton. Making Food Dollars Count. *Food and Nutrition*, 14(2):12-14, 1984

Ideas and information from a workshop and booklet developed by USDA entitled "Making Food Dollars Count" are described. The Expanded Food and Nutrition Education Program (EFNEP) in Illinois used the materials to train aides who work with homemakers. Activities included a contest to see how many families could be fed for \$58/week for a 4-5 month period. Recipes from the booklet were translated into Spanish to service Spanish-speaking families. As a result homemakers are using a grocery list more often, buying in larger quantities for economy, and comparison shopping. In New Jersey the materials have been tailored for Haitians and Cubans. A local resource system was developed to help newly relocated people learn about community services. Other programs that use the workshop materials to reach low-income families around the country are mentioned. Limited copies of the booklet are available for those working with low-income families.

INDIANA

IN1. Sue E. Frischie, Karen L. Konzelmann, Alice Blume, Donna Vandergraff. Exploring The Food Pyramid with Professor Popcorn. Purdue University Cooperative Extension Service, 4-H EFNEP, 1996

This curriculum will help young people develop into healthy adults by gaining an interest in eating healthy foods, using safe food handling techniques, and making physical activity part of their lifestyle. Specific goals are to provide nutrition and health information as well as the opportunity to practice new skills so that youth will be able to understand that good health is, in part, about the food and activity choices that they make daily; choose and use foods for good health that are consistent with MyPyramid and the 2005 Dietary Guidelines for Americans; improve practices in food selection, safety, and preparation; and enjoy being physically active.

IOWA

IA1. Kimberly Greder, Steven Garasky, Lois Wright Morton. Iowa State University. Emergency Food Resources: Meeting Food Needs of Iowa Households. *Iowa Food Security, Insecurity, and Hunger*, 2004

During June 2002, Iowa State University Extension conducted a survey of people who used food pantries in two urban (Polk and Scott) and two rural (Decatur and Monroe) counties in Iowa. Pantry staff distributed surveys to all adults who visited the pantries. The results presented in this study are based on 597 responses obtained from 477 urban, 60 rural, and 60 suburban pantry clients.

IA2. Grace Suzanne Marquis, Esi K. Colecraft, Mary Jane Oakland, Brenda D. Dobson, Judy Solberg, Peggy A. Martin. Education Intervention Using Stages of Change Enhanced WIC Caregivers' Intention to Offer Vegetables to Children, Iowa State University, 2001

To increase the frequency of vegetables offered to Iowan children, an education intervention using Stages of Change was implemented in clinics from 4 randomly selected WIC agencies. Clinics from 4 other agencies served as controls. Dietitians used a screening tool to stage caregivers (CG) on intention to offer children vegetables 3 times a day. In intervention clinics, CG's barriers to offering vegetables were identified and followed by interactive education modules tailored to their stage and barrier. Data were obtained via questionnaires and

abstraction from WIC records for each certification visit. The sample at initial certification was 2,089 CG-child pairs (52% intervention). At the 2nd, 3rd and 4th certification visits, there were 976, 304, and 84 pairs, respectively. CG advanced in stage with longer WIC program duration ($p<0.05$). CG in precontemplation/contemplation (PC) stage at baseline were more likely than those in preparation stage to advance ($P<0.05$); more intervention than control CG in PC advanced (56% vs. 46%; $p<0.001$). After controlling for initial stage, intervention and duration of program participation were associated with stage advancement ($p<0.05$); however, this did not translate to increased children's vegetable intakes. Participation in the WIC program influenced CG feeding intentions. Targeted education about vegetables can enhance this effect.

IA3. Connie Betterley, Cory Wessman, Helen Jensen. An Evaluation of the Costs and Benefits of Iowa's Expanded Food and Nutrition Education Program (EFNEP) Final Report, 2000

The Expanded Food and Nutrition Education Program (EFNEP) is an educational intervention program designed to help limited income adults with young children acquire the knowledge, skills, attitudes, and changed behavior leading to the improvement of the total family diet and nutritional well-being. The Federal program operates at approximately \$60 million per year, and has been in existence 1969. This study estimates the costs and benefits of Iowa EFNEP to measure the net economic impact of the program from September 1998 to February 2000 for the seven Iowa counties offering the program to eligible participants. The study finds that Iowa EFNEP returns a benefit-cost ration of \$10.75/\$1.00. The methods used are based upon the March 1999 Virginia Cooperative Extension Program Report, Applying Cost Benefit Analysis to

Nutrition Education Programs: Focus on the Virginia Expanded Food and Nutrition Education Program.

IA4. Connie Betterley, Brenda Dobson. Tools for Evaluating Written and Audiovisual Nutrition Education Materials. *Journal of Extension*, 38(4), 2000

Iowa State University Extension and the Iowa Department of Public Health jointly developed two guides and evaluation forms to help Extension nutrition educators, public health nutritionists, and others select educational materials that best meet the needs of target audiences. The Guide to Evaluating Written Nutrition Education Materials and the Guide to Evaluating Audiovisual Nutrition Education Materials each describe a four-step process to help educators: assess the needs of a target audience, evaluate the material using the review forms, pretest the materials with the target audience, and use the materials effectively. The guides describe why each step is important for successful nutrition education activities. The Written Nutrition Education Materials Review Form and the Audiovisual Nutrition Education Materials Review Form are printed in a 4-page, easy-to-read format that allows room for reviewer's notes. These guides and evaluation forms will provide Extension educators and others with an easy-to-use, systematic process for evaluating the appropriateness of written and audiovisual nutrition education materials for a variety of target audiences.

KANSAS

KS1. Agustina E. Susiyanti, Edgar Chambers IV, Meredith Pearson, Nancy M. Lewis. Calcium Intake, Attitudes Toward Calcium-Containing Foods, and Number of Risk Factors for Osteoporosis in Two Groups of 18- to 35- Year-Old Women. *Nutrition Research*, 16(8):1313-1329, 1996

Calcium intake, attitudes toward calcium-rich foods, and a number of risk factors for osteoporosis were identified and compared in women aged 18 to 35 from Kansas State University (KSU) and the Expanded Food and Nutrition Education Program (EFNEP). Each participant responded to questionnaires that assessed frequency of consumption of calcium-rich foods, attitudes toward calcium-rich foods, and level of risk for osteoporosis. Generally, the participants in EFNEP were older and had a higher body mass index than the KSU participants. Calcium intake was higher for EFNEP participants than for KSU participants. Almost 24% of KSU participants consumed less than two-thirds of the RDA for calcium compared to 12% of the EFNEP participants. Many attitudes toward calcium-rich foods were similar in the two groups, but differences occurred in attitudes related to health and the enjoyment of drinking milk. Based on a risk assessment questionnaire the EFNEP group had more lifestyle-related risks for osteoporosis that can be controlled, whereas the KSU group had more risks for osteoporosis associated with heritage or lack of bearing children, areas that cannot be controlled by educational programs. We conclude that these groups may need different approaches to calcium education because risk factors for osteoporosis were different and some attitudes were also different between the groups and among women in various calcium intake categories.

LOUISIANA

LA1. Beth Reames, Michael F. Burnett. Weight Management Practices of Black Paraprofessional Women. *Journal of the American Dietetic Association*, 91(7):841-843, 1991

Forty-four percent of adult black women in the United States are overweight compared with 27% of white women and 25% all adults. Health problems associated with excessive weight include increased risk for coronary heart disease, hypertension, diabetes, and some types of cancer. The Expanded Food and Nutrition Education Program (EFNEP) nutrition aides are paraprofessionals employed to provide nutrition information to low-income families. Ninety-eight percent of the EFNEP nutrition aides employed in Louisiana are black women, and most are indigenous to the low-income population with whom they work. Many of these aides, who serve as role models for homemakers participating in EFNEP, are obese and may be at risk for developing health problems. This study was designed to investigate the effect of participation in a weight control workshop, by black female paraprofessionals employed as EFNEP nutrition aides, on selected indexes, including dietary intake, nutrition knowledge, exercise practices, eating behaviors, anthropometric measurements, and sick leave hours used.

MARYLAND

MD1. Nadine R. Sahyoun, Charlotte A. Pratt, Amy Anderson. Evaluation of Nutrition Education Interventions for Older Adults: A Proposed Framework. *Journal of the American Dietetic Association*, 104(1):58-69, 2004

This study was undertaken to identify nutrition interventions that could provide a basis for designing effective and measurable nutrition education programs for older adults. The authors conducted a literature search of articles published from 1990-2003 using Medline and Agricola. Key words were "elderly," "older adults," "nutrition intervention," and "nutrition education." Of 128 references identified, 25 studies included intervention and/or evaluation components and targeted adults over age 55 years. Although interventions tended to report limited success in behavior change, certain features had positive outcomes. These included limiting educational messages to one or two; reinforcing and personalizing messages; providing hands-on activities, incentives, cues, and access to health professionals; and using appropriate theories of behavior change. Based on these findings, a theoretical framework that includes these features but is set within a social and environmental context is proposed as a guideline for designing nutrition interventions for older adults.

MASSACHUSETTS

MA1. Linda Weinreb, Cheryl Wehler, Jennifer Perloff, Richard Scott, David Hosmer, Linda Sagor, Craig Gunderson. Hunger: Its Impact on Children's Health and Mental Health. *Pediatrics*, 110(4):41, 2002

Objective. Hunger, with its adverse consequences for children, continues to be an important national problem. Previous studies that document the deleterious effects of hunger among children cannot distinguish child from family hunger and do not take into account some critical environmental, maternal, and child variables that may influence child outcomes. This study examines the independent contribution of child hunger on children's physical and mental health and academic functioning, when controlling for a range of environmental, maternal, and child factors that have also been associated with poor outcomes among children.

MA2. Karen M. Emmons, Everly Macario, Glorian Sorensen, Mary K. Hunt, Rima E. Rudd. Nutrition Education for Cancer Prevention Among Low- Income Populations: An Extension of the EFNEP Model. *Journal of Nutrition Education*, 31(1):47-53, 1999

This paper reports a pilot test of the feasibility of implementing an extension of the Expanded Food and Nutrition Education Program (EFNEP) home-based nutrition education intervention in order to maximize involvement of participants' naturally occurring social networks and to target cancer prevention eating patterns. Community residents served as hostesses of a two-session "Nutrition Home Party" and invited at least six family members/friends to attend the sessions, which were held in their homes. Paraprofessionals indigenous to the community facilitated the sessions. Nutrition education sessions were based on the Food Guide Pyramid and the Nutrition Facts label, with emphasis placed on encouraging participants to consume at least five servings of fruits and vegetables a day to reduce their risk of cancer. Preliminary experience with a home-based intervention model indicates that there is considerable potential for working through existing social networks to reach low-income populations.

MA3. Margaret J. Randall, Muriel S. Brink, Amy B. Joy. EFNEP: An Investment in America's Future. *Journal of Nutrition Education*, 21(6):276-279, 1989

Evidence of poverty, poor health, inadequate living conditions, and the plight of families unable to feed their children surfaced in the U.S. during the early 1960's. Delegations of physicians, legislators and others verified the reports, while a television documentary show, "Hunger USA" (1968), brought the national tragedy into the homes of middle class Americans and set the stage for a decision to convene a White House Conference on Food, Nutrition and Health in December 1969. For its part, the Federal Extension Service established a Task Force to explore why the poor of the 1960's were not currently involved in Extension's educational programs, despite Extension's history of work with poor farm families. One response to the Task Force report was the funding of five major USDA pilot programs designed to reach low-income audiences through an innovative educational approach. This effort marked a renewal of Extension's historical philosophy of programming for low-income audiences – investing in people's ability to help themselves. Building upon these pilot projects, the Expanded Food and Nutrition Education Program (EFNEP) for adults was created in 1968. In 1969 Congress saw fit to legislatively authorize and provide a budget for the EFNEP, and in 1971 they set aside some of the EFNEP funds for the establishment of an EFNEP youth component. Now, twenty years later, the EFNEP remains the single largest federally-funded nutrition education program in the United States. As the EFNEP enters its third decade, it is timely to discuss several significant features associated with the EFNEP's success.

MICHIGAN

MI1. Gayle Coleman, Mildred Horodyski, Dawn Contreras, Sharon Hoerr. Nutrition Education Aimed at Toddlers (NEAT) Curriculum. *Journal of Nutrition Education and Behavior*, 37(2):96-97, 2005

This curriculum emphasizes the roles of adults and children in the feeding relationship; that is, adults are responsible for what food is served and when it is served, and children are responsible for deciding how much to eat or whether to eat. The lessons and reinforcing activities include strategies for introducing new foods to toddlers, dealing with "picky" eaters, developing parenting skills related to feeding toddlers, dealing with toddlers' behaviors, and involving toddlers' behaviors, and involving toddlers in food preparation. Content areas for the NEAT curriculum are based on 3 focus groups conducted with low-income parents of toddlers.

MINNESOTA

MN1. Terryl J. Hartman, Pamela R. McCarthy, Rosemarie Park, Ellen R. Schuster, Lawrence H. Kushi. Evaluation of the Literacy Level of Participants in an Urban Expanded Food and Nutrition Education Program. *Journal of Nutrition Education*, 26(1):37-41, 1994

The Minnesota Extension Service's Expanded Food and Nutrition Education Program (EFNEP), and the College of Education and School of Public Health at the University of Minnesota are cooperating to develop and evaluate the effectiveness of a cardiovascular disease prevention nutrition education program targeted at a population with low literacy skills. This collaborative effort, entitled the "Innovative Dietary Education Approaches" (IDEA) Project, began in September, 1991.

MN2. Terryl J. Hartman, Pamela R. McCarthy, Rosemarie J. Park, Ellen Schuster, Lawrence H. Kushi. Focus Group Responses of Potential Participants in a Nutrition Education Program for Individuals with Limited Literacy Skills. *Journal of the American Dietetic Association*, 94(7):744-748, 1994

Objective: To obtain information to direct the design and development of a nutrition intervention program targeted at a low-literacy audience Subjects: Thirty-nine female and two male clients of the Expanded Food and Nutrition Education Program (EFNEP) participated in five focus-group discussions. The focus groups included 23 African American, 9 white, 4 Southeast Asian, 1 American Indian, 2 Hispanic American, and 2 Middle Eastern EFNEP participants. Design: All focus groups were moderated and co-moderated by University of Minnesota staff members. The focus groups were tape-recorded and transcribed. A written report was generated based on the independent evaluation of two staff members. Results: We learned that EFNEP participants thought they would be motivated to change their eating habits for health concerns, including weight loss, and to help their families develop healthful eating habits. They mentioned several barriers to making changes, including extra time and money needed to purchase and prepare healthful foods, food preferences of family members, lack of interest and skills in cooking, and insufficient knowledge about which foods are healthful. Participants shared ideas for program content and delivery. Conclusions: Clients with limited literacy skills have valuable opinions and insights that program developers targeting this hard-to-reach group should hear. The EFNEP participants wanted simple, practical, and relevant information about what foods to eat and how to prepare them. They considered lectures an ineffective way to receive nutrition information, and they expressed a preference for hands-on activities that were enjoyable and allowed participants to share ideas and experiences.

MISSOURI

MO1. Betty R. Carruth, Helen L. Anderson. Scaling Criteria in Developing and Evaluating an Attitude Instrument. *Journal of the American Dietetic Association*, 70(1):42-47,1977

An attitude instrument was developed and evaluated, containing forty statements purporting to measure an individual's attitude toward the practice of nutrition. The instrument was administered to selected Missouri Nutrition Education Assistants (NEAs) in the state's Expanded Food and Nutrition Education Program (EFNEP). The instrument demonstrated statistical reliability over time; validity was established initially by a panel of judges. Using factor analysis, the responses of the NEAs were assessed. It was found that the forty statements were not internally consistent, and that internal consistency does not necessarily co exist with proven statistical reliability and validity. More rigorous methodology should be applied to instruments that purport to measure attitudes in nutrition research.

NEVADA

NV1. Joyce Woodson, Leslie Sgamma. The Challenge of Reaching a Culturally Diverse Audience. *Journal of Extension*, 35(3), 1997

Nevada's tremendous population growth has dramatically changed the state's racial and ethnic picture. The Hispanic population grew 131% between 1980 and 1990. Of the 124,000 Hispanics in Nevada in 1990, nearly 70 percent were from Mexico. Additional immigrants came from other Central and South American countries as well as Puerto Rico and Cuba. The

booming job market in Nevada offered primarily poverty level or near-poverty level wages to many of these non-English speaking and unskilled workers. Southern Nevada nutrition specialists conducted a needs assessment in 1992. During this process local agencies expressed concern regarding the lack of educational programs for Hispanic families. Coordinators for WIC (a supplemental, nutritional program for Women, Infants and Children) reported that there were 5,223 Hispanic participants (35% of total) in the WIC program in Clark County. Difficulties were identified in meeting the needs of these clients since many did not speak English and needed more intensive nutrition education than WIC was able to provide. Initial screenings indicated a growing number of Hispanics at a high nutritional risk. In a recent study, Eliades and Sutor (1994) document food-related problems that immigrants experience in their new environment. Some of these problems are: a) difficulty in obtaining familiar foods and spices; b) when obtained, the cost of these foods is high; c) inability to locate acceptable substitutes for familiar food items; and d) inability to read labels and information on food packages. The desire of Cooperative Extension to collaborate with WIC resulted in the development of Extension Service/WIC Nutrition Education Initiative, project Number 93-ENED-1-7510. Nevada was one of 17 states that received funding through the competitive grant program. Nevada seized this opportunity to address an identified need. Culturally sensitive and appropriate Spanish language nutrition education materials for this diverse population were not readily available. After a thorough review of materials, the decision was made to adapt an existing curriculum from California's Expanded Food and Nutrition Education Program (EFNEP).

NEW HAMPSHIRE

NH1. Valerie Long, Tamara Martin, Colette Janson-Sand. The Great Beginnings Program: Impact of a Nutrition Curriculum on Nutrition Knowledge, Diet Quality, and Birth Outcomes in Pregnant and Parenting Teens. *Journal of the American Dietetic Association*, 102(3):86-89, 2002

Developed by University of New Hampshire Cooperative Extension, Great Beginnings is a 6-lesson nutrition curriculum consisting of presentations, discussions, and hands-on activities. This curriculum is based on the identified needs of pregnant teens and highlights critical nutrition issues of pregnant adolescents. This research-based curriculum extends beyond the prenatal period and provides each teen with the opportunity to realize the important role she plays in shaping her own health along with her baby's health and development. The Great Beginnings curriculum was used as the implementation tool to determine the impact of a nutrition curriculum for pregnant and parenting teens on nutrition knowledge, diet quality, and birth outcomes.

NEW JERSEY

NJ1. Mary S. Bergman. Improving Birth Outcomes with Nutrition Intervention. *Topics in Clinical Nutrition*, 13(1):74-79, 1997

The prevalence of low-birth weight (LBW) infants born to teenagers is a challenge to nutrition educators. In Camden, New Jersey, the number was staggering as was the reality that malnourished children were themselves bearing children. The Expanded Food and Nutrition Education Program (EFNEP), Rutgers Cooperative Extension, was the ideal vehicle to deliver nutrition education to this population. Since pregnant teens respond to incentives, special funding was obtained. The results of this program indicate the effectiveness of intensive

nutrition education for pregnant teens. EFNEP's success points to the 6.5% LBW rate at the end of the study as compared to Camden's 12.7% LBW rate.

NEW YORK

NY1. Dollahite J, Kenkel D, Thompson CS. An Economic Evaluation of the Expanded Food and Nutrition Education Program. *Journal of Nutrition Education and Behavior*, 40(3):134-43, 2008

OBJECTIVE: To evaluate the New York State Expanded Food and Nutrition Education Program using economic methodology. DESIGN: Data were collected by nutrition educators in a pretest, posttest design with an epidemiological modeling approach to assess costs and estimate potential health benefits of the state program. SETTING: Cooperative Extension, 35 counties. PARTICIPANTS: 5730 low-income participants. INTERVENTION: Series of 6 or more food and nutrition lessons. MAIN OUTCOME MEASURES: Cost (program and participant); health benefits in quality adjusted life years (QALYs); and monetized benefits: society's willingness to pay for QALYs, and benefits of avoiding or delaying health care costs and loss of productivity. ANALYSIS: Cost-effectiveness estimated from behavior change and QALY weights. Cost-benefit ratios estimated from costs and monetized benefits. Sensitivity analyses provided ranges where lack of agreement exists around parameters' values. RESULTS: Cost was \$892/graduate. Cost-effectiveness was 245 QALYs saved, at \$20863/QALY (sensitivity 42-935 QALYs, \$5467-\$130311 per QALY). Societal willingness to pay benefit-to-cost ratio was \$9.58:\$1.00 (sensitivity \$1.44-\$41.92:\$1:00); narrow governmental benefit-to-cost ratio was \$0.82:\$1.00 (sensitivity \$0.08-\$4.33:\$1:00). CONCLUSIONS AND IMPLICATIONS: Outcome data indicate that food and nutrition behavior changes resulting from the Program are likely to improve future health and reduce health care costs. Cost-effectiveness is estimated to be as great as for many current health interventions.

NY2. Katherine L. Dickin, Jamie Dollahite, Jean-Pierre Habicht. Nutrition Behavior Change Among EFNEP Participants is Higher At Sites That are Well-Managed and Whose Front-Line Nutrition Educators Value the Program. *Journal of Nutrition*, 135:2199-2205, 2005

Effective programs to promote improved dietary practices among low-income families depend on the motivation and performance of front-line nutrition educators, yet little is known about the work context experienced by nutrition workers or how their perceptions of work context relate to program effectiveness. This research examined the perceived work context of nutrition educators, a multi-dimensional construct developed through formative research, in the Expanded Food and Nutrition Education Program in New York State. We proposed that work context, program management, and program and educator characteristics would be related to program effectiveness (reported behavior change among participants). A state-wide survey of paraprofessional Community Nutrition Educators (CNEs) in 30 program sites was conducted and analyzed in relation to program monitoring data. Greater behavior change was reported by participants in sites where CNEs gave positive ratings to the value of EFNEP ($p < 0.02$) and to the managerial practices of their supervisors ($p < 0.001$). This is, to our knowledge, the first time that a relationship has been demonstrated between perceived work context at the front-lines and effectiveness of a nutrition program. Higher behavior change scores were also reported in sites where a greater proportion of participants received individual rather than group instruction ($p < 0.001$). Relationships between participants' reported behavior change and CNE' perceptions

of program value and program management suggest that improvements in these areas could enhance nutrition program success.

NY3. Jamie Dollahite, Michelle Scott-Pierce. Outcomes of Individual vs. Group Instruction in EFNEP. *Journal of Extension*, 41(2), 2003

This article presents an analysis of self-reported behavioral outcomes from three years' of New York State EFNEP evaluation data. Participant instruction has shifted from a primarily one-on-one format to group instruction because of staff safety concerns and the impact of welfare reform on recruitment, as well as financial constraints. The question is raised regarding the cost-effectiveness of group education as currently delivered. If groups are unavoidable in the current climate, educators need to identify strategies to maximize impact among participants educated in group settings.

NY4. Jamie Dollahite, Christine Olson, Michelle Scott-Pierce. The Impact of Nutrition Education on Food Insecurity Among Low-Income Participants in EFNEP. *Family and Consumer Science Research Journal*, 32(2):27-139, 2003

The impact of nutrition education on food security status was assessed in a multiethnic, low-income population using a pre-test, post-test comparison group design. Data were collected over three years from participants (n=16,146) in the Expanded Food and Nutrition Education Program (EFNEP) in New York State who either graduated or terminated involvement prior to graduation. Both groups had a significant decrease in food insecurity score ($p<0.05$) from pre-to post-education. At exit from the program, the difference between the graduated and terminated groups approached statistical significance using a t-test comparison ($p=0.055$). A multiple regression analysis, which controlled for sociodemographic and program characteristics, indicated that food insecurity score decreased significantly more in graduates than terminated participants ($p<0.001$). A dose response relationship was seen between the number of lessons received and decreases in food insecurity. Programs that educate low-income families in food selection and resource management skills can decrease the risk of food insecurity, although effects vary by sociodemographic characteristics of participants and program delivery methods.

NY5. V. Kraak, Pelletier, J. Dollahite. Food, Health, and Nutrient Supplements Beliefs Among Food Stamp-Eligible Women and Implications for Food Stamps Policy. *Family Economics and Nutrition Review*, 14:21-35, 2002

Several U.S. professional organizations that develop research-based dietary recommendations for the public support the position that most nutrients can and should be obtained by consuming a balanced diet. This is in contrast to the widespread and growing use of supplements by the public and changes in public policy currently under consideration, such as the proposal to allow the purchase of nutrient supplements with food stamps. Prompted by this proposal, this study investigated the attitudes and beliefs in a diverse sample of food stamp eligible women, recruited from the Expanded Food and Nutrition Education Program and Food Stamp Nutrition Education, concerning the relationship among food, health, nutrient supplementation, and associated lifestyle factors; and relates these findings to the on-going policy dialogue. The findings suggest the need to clarify the policy goals, and broaden the set of explicit criteria used when considering supplement-related policies in this population.

NY6. Catherine G. Arnold, Jeffrey Sobal. Food Practices and Nutrition Knowledge After Graduation From the Expanded Food and Nutrition Education Program (EFNEP). *Journal of Nutrition Education*, 32(3):130-138, 2000

The Expanded Food and Nutrition Education Program (EFNEP) is a federally funded nutrition program designed to educate low-income families about key areas of nutrition and food safety. This study examined the benefits gained and maintained by participants in EFNEP in food practices, nutrition knowledge, nutrient intake, and other areas. A prospective, within-subject design was used to examine a randomly selected sample of 59 EFNEP graduates in two New York State counties. Self-reported information was gathered at entry into EFNEP, graduation from the program, and follow-up 1 year after completion of the program. Analyses used bivariate chi-square and t-tests and multivariate regression. Food budgeting, food preparation, food safety practices, and nutrition knowledge improved between entry and graduation. Most increases in knowledge and reported practices were maintained between graduation and follow-up. Few differences in reported nutrient intake were present between entry, graduation, and follow-up. Additional reported changes beyond food and nutrition occurred in education, employment, health, and community involvement. Overall, participation in EFNEP increased the nutrition knowledge and food management skills of low-income women. Many of these proficiencies persisted after completion of the program, and other benefits of the program occurred. Future analyses are needed to evaluate immediate and longer term effects of EFNEP in diverse audiences, with larger samples, using more powerful research designs, and including additional validated measures.

NY7. Helena Pachon, Christine Olson. Retrospective Analysis of Exclusive Breastfeeding Practices Among Four Hispanic Subgroups in New York's EFNEP. *Journal of Nutrition Education*, 31(1): 39-46,1999

This research was carried out to describe exclusive breastfeeding (EBF) practices and their correlates among four Hispanic subgroups of women living in New York State. Hispanic women (n = 136) enrolled in the Expanded Food and Nutrition Education Program (EFNEP) were asked about their infant feeding practices at birth and sociodemographic characteristics. Specifically, Puerto Rican (n=59), South American (n=23), Central American (n=15), and Dominican (n=39) women were studied. Chi-square, logistic regression, and pattern analyses were used to identify EBF correlates. Overall, 46% of the Hispanic infants surveyed were EBF. The difference in EBF incidence among subgroups was significant (p<.002): Puerto Rican, 27.6%; South American, 69.6%; Central American, 60.6%; and Dominican, 33.3%. South American women were 4.072 (95% confidence interval [CI]: 1.100 - 15.071) times more likely than Puerto Rican women to EBF. Hispanic women who were not born in the mainland U.S. were 5.833 (95% CI: 1.043 - 32.619) times more likely to EBF than women born on the mainland U.S. These data indicate that there are differences in EBF and its correlates among Hispanic subgroups. Results suggest the need for (1) larger studies examining EBF among Hispanic subgroups and (2) subgroup-specific intervention strategies to more effectively promote and support breastfeeding in the diverse Hispanic population.

NY8. Muriel S. Brink, Jeffrey Sobal. Retention of Nutrition Knowledge and Practices Among Adult EFNEP Participants. *Journal of Nutrition Education*, 26(2):74-78, 1994

This preliminary study examined long-term effects on food and nutrition behaviors and other benefits of the adult Expanded Food and Nutrition Program (EFNEP) on participants who completed the program. Data collection instruments included the Family Record form and at follow-up, an open-ended questionnaire to determine additional benefits. The impact of EFNEP on nutrition knowledge and practices and retention of information after graduation was examined among 50 participants in New York City who were assessed at program entry, graduation, and a 1-year follow-up. For 10 of 12 food behaviors, the participants improved significantly between entry and graduation. At follow-up the gains made during the program were maintained. Significant improvement occurred for two behaviors. Data from a 24-hour recall revealed a significant decrease between entry and graduation in the amount and percentage of calories from fat. Between graduation and follow-up, mean protein, calcium, and vitamin A intakes declined but were within acceptable ranges or exceeded NRC RDAs. Significant increases in nutrition knowledge existed for all four items examined; additional increases in nutrition knowledge occurred between graduation and follow-up. The participants also attributed personal and social improvement to EFNEP participation at follow-up including help in their jobs, community participation, and improved family and personal health.

NY9. Barbara Bremner, Cathy C. Campbell, Jeffrey Sobal. Comparison of the Beliefs and Practices of EFNEP Clients with Staff Perceptions of Clients. *Journal of Nutrition Education*, 26(3):123-130, 1994

This study examined how accurately the paraprofessionals and professionals employed by the Expanded Food and Nutrition Education Program (EFNEP) in New York State perceived the beliefs and practices of their clients. Because paraprofessionals are indigenous workers, they are assumed to have more accurate perceptions of clients than professionals, potentially making them more effective communicators. A series of 36 semistructured interviews with program clients and staff was employed to develop the quantitative measuring instruments used in personal interviews with a purposive sample of 51 clients and as a self-administered questionnaire with all EFNEP staff (43 professionals and 173 paraprofessionals). Results showed that both paraprofessionals and professionals held inaccurate perceptions of their clients in the areas of health, nutrition, resource management, learning, and knowing. EFNEP staff frequently underestimated the ability and self-esteem of clients and the extent to which clients adhered to and considered important the EFNEP objectives. Contrary to expectation, paraprofessionals did not have perceptions of clients that were any more accurate than were those of professionals. These findings suggest that attention to the recruiting, hiring, and training practices of the EFNEP may reduce the disparities between staff perceptions and client responses.

NY10. Alice A. Cadwallader, Christine M. Olson. Use of a Breastfeeding Intervention by Nutrition Paraprofessionals. *Journal of Nutrition Education*, 18(3):17-22, 1986

A breastfeeding intervention program was initiated among low-income women as part of the New York State Expanded Food and Nutrition Education Program (EFNEP). As part of a formative evaluation of the intervention, the relationship between selected experiences, attitude, knowledge, and expectation variables and EFNEP aides' intentions to carry out the program was examined. Questionnaires were distributed at the introduction of the program and 8 months later to collect information on the selected variables. Regression analyses revealed that items that best

predicated aides' initial intentions to implement the program included 1) their attitudes about the drawbacks of breastfeeding and the drawbacks of teaching about breastfeeding, 2) their perceived confidence of their knowledge of the topic, and 3) the expectations of others. The best predictors of the aides' intentions to continue to use the program after 8 months were 1) the number of pregnant homemakers they had worked with, 2) concerns about the drawbacks of teaching about breastfeeding, and 3) the expectations of others. Positive attitudes, knowledge, and perceptions about breastfeeding are important in implementing a breastfeeding intervention program. Findings suggest that further training and support should focus on reducing the perceived drawbacks of teaching breastfeeding, strengthening feelings that others expect implementation, and increasing an individual's confidence in dealing with problems and questions that arise.

NY11. Janet Matthews Fitchen. Working With Families Through Cooperative Extension Expanded Food and Nutrition Education Program: A Guide for Cooperative Extension Agents and Aides. 130-139, 1977

Information is provided to assist the understanding and effectiveness of Expanded Food and Nutrition Education Program (EFNEP) workers in dealing with nutritional problems in low-income families. In addition to problems directly related to nutrition, low-income families often have para-nutritional problems that make the implementation of nutrition recommendations difficult. Awareness of these problems is essential if nutritional gains are to be made in such families. Para-nutritional problems of low-income homemakers include: finances; self-image; homemaking image; diet rigidity; psychological handicaps; marital conflicts; and insufficient health attention. The guide is intended as a starting point, continuing reference, and a problem-sorting model for EFNEP aides; it is not intended to serve as a how-to manual. While both nutritional and para-nutritional problems of low-income families are discussed, no attempt has been made to treat all possible problems. An annotated bibliography of references suggested in the discussion of nutritional problems, and a compilation of miscellaneous appropriate teaching resources, also are provided.

NORTH DAKOTA

ND1. North Dakota State University Extension Service. Eating Right is Basic – and Fun!: A Guide for Nutrition Education for Native American 4th Graders. NDSU Extension Service, 1994

This is a guide for classroom instruction developed by EFNEP program assistants working in schools at four North Dakota Indian reservations. The objectives of this curriculum are to increase knowledge of the major nutrients and food groups; to make participants able to select recommended amounts (servings) of a variety of foods; to show positive improvements in nutrition knowledge and food behavior records; and to help participants better understand health and disease issues specific to their culture, and how to deal with them.

OHIO

OH1. Ruth M. Conone. EFNEP: Reaching Out to Families in Poverty. *Journal of Home Economics*, 84(4):38-41, 1992

This article briefly reviews the Expanded Food and Nutrition Education Program of the Cooperative Extension Service. It describes the program, its accomplishments and needs for nutrition education among low income groups.

OKLAHOMA

OK1. Betty A. Wakou, Kathryn S. Keim, Glenna S. Williams. Personal Attributes and Job Competencies Needed by EFNEP Paraprofessionals as Perceived by EFNEP Professionals. *Journal of Nutrition Education and Behavior*, 35(1):16-23, 2003

To determine the personal attributes and job competencies that are necessary for the job success of Expanded Food and Nutrition Education Program (EFNEP) paraprofessionals as perceived by EFNEP professionals. Design: A qualitative descriptive design and a 3-round modified Delphi methodology was used. Participants: A convenience sample of 14 state and 20 county EFNEP professionals participated in all 3 Delphi rounds. The response rates for state and county professionals for all 3 Delphi rounds were 70% and 91%, respectively. Variables Measured: Personal attributes and job competencies were generated and the level of importance was determined. Analysis: An independent t test was employed to determine differences between importance scores by professional position. Results: Thirty-seven personal attributes, 18 job competencies prior to hire, and 43 job competencies after training were generated and the majority were very important. County EFNEP professionals tended to score personal attributes and job competencies as more important than state EFNEP professionals. Implications: These personal attributes and job competencies prior to hire can guide hiring decisions and initial training content. The job competencies after training can shape content for inservice training.

OREGON

OR1. Ellen Schuster, Zelda L. Zimmerman, Molly Engle, Janice Smiley, Ellen Syversen, Jill Murray. Investing in Oregon's Expanded Food and Nutrition Education Program (EFNEP): Documenting Costs and Benefits. *Journal of Nutrition Education and Behavior*, 35(4):200-206, 2003

Objective: To apply Virginia's cost-benefit analysis (CBA) model developed for a large Expanded Food and Nutrition Education Program (EFNEP) to Oregon's small EFNEP. To estimate a cost-benefit ratio for Oregon's EFNEP based on retrospective analysis of program costs and optimal nutrition behaviors (ONBs) in relation to potential health-related savings for diet-related chronic diseases/conditions. Design: Standard components of a CBA. Subjects/Settings: 368 adult graduates of Oregon State University's Extension Service EFNEP during the 1999-2000 program year. Intervention: Prior participation in the EFNEP with a mean of 10.4 lessons. Main outcome measures: Cost-benefit ratio and several sensitivity analyses. Analysis: EFNEP program graduates practicing ONBs related to prevention/delay of diet-related chronic diseases/conditions were determined using SPSS (Base 10 computer program). Cost-benefit ratios were computed using Microsoft Excel. Results: CBA determined a 1:3.63 cost-benefit ratio (in 1999 dollars). Conclusions and Implications: Virginia's CBA model was useful

in the retrospective evaluation of Oregon's small EFNEP. With Oregon's benefits exceeding costs, CBA provides evidence for resource allocation and justification for program continuation.

OR2. Ellen Schuster, Holly Berry, Renee Carr, Sharon Cartwright, Steve Dodrill, Molly Engle, Brian Lazatin, Mark Miner, Dwight Owens, Bob Rost, Trena Shanks, Janice Smiley, Tom Weeks. Helping Teen Parents Feed Their Young Children Learning Module. *Journal of Nutrition Education and Behavior* 35(3), 2003

In 2000, a team of Oregon State University EFNEP/FSNE faculty and Extension communications Specialists applied for and received a \$10,000 grant to design a web-based staff development module. The module focuses on how to train staff members to work with teen parents and teach them to feed their young children. Unique aspects of the module include audio narration, video clips of interviews with teen parents, links with other publications for downloading, and teaching tips. An internal review of the module by 12 OSU Extension faculty and program assistants, and external field-testing with users from other states (15 responses out of 22 distributed) gave positive feedback about the module. Most internal reviewers felt they could teach the information in the module to others and were interested in using the module in the future. External field testers found the module acceptable/easy to use (93%), teaching tips very useful and/or effective (80%), and would recommend it to others (66.67%). In 2003, the web-based module was converted to CD-ROM format and made available for purchase through OSU Extension & Experiment Station Communications.

PENNSYLVANIA

PA1. Wenrich TR, Cason KL. Consumption and perceptions of soy among Low-income Adults. *Journal of Nutrition Education and Behavior*. 2004;36(3): 140-145.

Objective: To assess the consumption and perceptions of soy among low-income adults. Design: A survey, which included demographic items, Likert scales for items on perceived benefits and barriers to soy consumption and factors that may increase soy consumption and a soy food consumption frequency questionnaire. Subjects/Setting: A convenience sample of 353 adults enrolled in either the Pennsylvania Expanded Food and Nutrition Education Program or the Pennsylvania Food Stamp Nutrition Education Program. Statistical Analysis: Descriptive statistics. Results: Few participants (13%; n=44) reported currently consuming soy foods. The percentage of respondents recognizing potential health benefits of soy ranged from 53% to 57%. The major barriers to soy consumption were a lack of knowledge on how to use soy (87%), cost (55%), and unavailability (45%). Participants indicated that education on how to use and incorporate soy into the diet (88%) and addition of soy into familiar foods (82%) may increase their soy consumption. Applications/Conclusions: The findings suggest that this population would benefit from exposure to soy foods and instruction on preparing low-cost soy foods that can easily be included in their diet, in addition to education on the potential health benefits of soy foods. The results may provide direction for the development of curricula that educate this population on the potential benefits and uses of soy.

PA2. Wenrich TR, Cason KL. Focus groups identify low-income audiences' perceptions and educational needs regarding soy: nutrition educators' perspectives. *Topics in Clinical Nutrition*. 2004;19(2):148-153.

This study assessed the perceived benefits and barriers of soy consumption, and factors that may encourage soy consumption, among low-income adults. Three key informant focus groups were conducted with nutrition educators (n=26) who regularly work with participants in the Pennsylvania Expanded Food and Nutrition Education Program (EFNEP) and the Pennsylvania Food Stamp Nutrition Education Program (FSNEP). Results indicate that low-income individuals would benefit from soyfood sampling, education on preparing soyfoods, and education on the health benefits of soy. Simple handouts or pamphlets, videos, displays, and hands-on group activities could all be effective means of conveying this information.

PA3. Wenrich TR, Cason KL, Lv N, Kassab C. Food safety knowledge and practices of limited resource adults in Pennsylvania. *Food Protection Trends*. 2003; 23(4): 326-335.

The purpose of this study was to assess the food safety knowledge and behavior of low income adult audiences. One hundred thirty-nine usable surveys were received from participants in the Pennsylvania Expanded Food and Nutrition Education Program (EFNEP) and the Food Stamp Nutrition Education Program (FSNE). The 58 survey questions included items related to three scales measuring knowledge of food safety, consumption of high risk foods, and food safety practices. Results indicate that certain risky food practices and beliefs are fairly common among this population. Temperature abuse was a frequent problem. The majority of respondents (65%) incorrectly thought food should be allowed to cool before being placed in the refrigerator and 64% did not acknowledge that keeping food in the refrigerator above 40°F will make food poisoning more likely. Respondents tended to indicate that they infrequently ate high-risk foods; however, the most frequently consumed high-risk foods were those made at home from raw/undercooked eggs. Persons with higher income levels and males consumed certain risky foods significantly more often than other respondents did. On average, respondents indicated that they “usually” engaged in food safety practices that prevent cross-contamination. Of these practices, respondents were least likely to wash cutting boards with disinfectant or in the dishwasher between using them for different foods. Older respondents were most likely to engage in safe food procedures. Information obtained from this study may provide direction to EFNEP, FSNE, and other nutrition education programs for more effective educational programming in food safety.

PA4. Cason KL, Scholl J, Heald JW, Harrington C. Sensational SuperCupboards. *Journal of Extension*. 2002; 40(5).

No abstract. This article is online at <http://www.joe.org/joe/2002october/iw3.shtml>.

PA5. Cason KL, Scholl JF, Kassab C. A Comparison of Program Delivery Methods for Low Income Nutrition Audiences. *Topics in Clinical Nutrition*. 2002; 17(4): 63-73.

The purpose (if this study was to examine the effectiveness of Expanded Food and Nutrition Education Program (EFNEP) education on dietary adequacy and food-related behaviors of participants reached through individual, group, or SuperCupboard methods. The sample consisted of 2,059 participants. Results from this study suggest that the collaborative, learner-centered method of teaching (one-on-one) is the most effective in eliciting educational program impact. Group nutrition interventions do result in positive behavior changes in the

participants. However the effectiveness and maintenance of adherence may require additional effort in order for group education to be cost effective.

PA6. Maryfrances Marecic, Judith Heald, Irene Strychar, Cheryl L. Achterberg, Lisa Sullivan. Eating for a Better Start (EFABS): Instructor's Manual: A Nutrition Program for Pregnant Adolescents Participating in the Expanded Food and Nutrition Education Program (EFNEP). University Park, PA. Penn State, College of Agricultural Sciences: College of Health and Human Development, 1995

This manual was developed for EFNEP personnel working with pregnant adolescents. The manual is divided into four lessons covering discomforts of pregnancy (i.e., nausea, heartburn, constipation), nutrient needs, weight gain, substance use and abuse, breastfeeding, formula feeding, and infant feeding. Also lists additional resources, bibliographies on nutrition during adolescent pregnancy, and sources of inexpensive or free nutrition publications.

PA7. Irene M. Strychar, Cheryl L. Achterberg, Lisa A. Sullivan. EFNEP for Pregnant Teens. *Journal of Nutrition Education*, 23(1), 1991

The objective of our program was to develop a curriculum containing a set of materials that were accurate, practical, and appealing to both EFNEP personnel and pregnant teens.

SOUTH CAROLINA

SC1. Cason KL, Logan B. Educational intervention improves fourth-grade schoolchildren's nutrition and physical activity knowledge and behaviors. *Topics in Clinical Nutrition*. 2006; 21(3):234-240.

Many obesity interventions have taken place in clinical settings; however, schools are ideal places to develop and implement innovative interventions designed to prevent childhood obesity. The findings of this study indicate that the nutrition and physical activity intervention was significantly related to change in knowledge, food consumption, food-related behaviors, and physical activity behaviors. Scores of students in the intervention classrooms were significantly higher than those of students in the control classrooms. These improvements were maintained at the 5-month follow-up.

SC2. Cason KL. Effectiveness of a program to increase fruit and vegetable consumption. *Journal of Extension*. 2005;43(4). Article No. 4IAW2.

Americans do not ordinarily consume the recommended servings of fruits and vegetables, thereby placing them at risk for the development of chronic diseases. EFNEP and the South East Produce Council implemented a program designed to increase consumption of fruits and vegetables by low-income audiences reached through EFNEP. Pre-program surveys provided a profile of the families' fresh produce purchases and consumption level. Post-program data indicates that the program participants made a significant increase in their consumption of fruits and vegetables.

SC3. Cason KL, Cox R, Wenrich TR, Burney J, and Poole K. Food Stamp and Non-Food Stamp program participants show similarly positive change with nutrition education. *Topics in Clinical Nutrition*. 2004;19(2): 136-147.

A retrospective study compared Food Stamp Program (FSP) and non-FSP participants on changes in dietary intake and food-related behaviors as a result of an educational intervention. Data were collected at preintervention and postintervention on 4121 low-income adult, using 24-hour recalls and a Food Behavior Checklist (FBC). Both FSP and non-FSP participants made significant improvements on assessed food groups, nutrients, and FBC items. Few differences were found on dietary change, but FSP participants made more improvements on 4 FBC items. Results indicate that nutrition education is similarly effective in improving dietary intake and food-related behaviors of FSP and non-FSP participants.

SC4. Barbara H. D. Luccia, Mary E. Kunkel, Katherine L. Cason. Dietary Changes by Expanded Food and Nutrition Education Program (EFNEP) Graduates Are Independent of Program Delivery Method. *Journal of Extension*, 41:3, 2003

The Expanded Food and Nutrition Education Program (EFNEP) was established in 1969 to provide education to limited resource audiences with the goal of reducing levels of food insecurity and improving their nutritional health. EFNEP, administered by the Cooperative Extension Service in all 50 U.S. states, employs paraprofessionals to help families improve dietary practices and to more effectively manage their available resources. The paraprofessionals provide intensive nutrition education in a variety of non-formal educational settings, including homes, community centers, housing complexes, WIC offices, and churches. Innovative program delivery methods and program curriculum, such as videos and interactive CDs, have been incorporated into EFNEP. When the program was initiated, instruction was conducted primarily in the home through one-on-one education. In the 1980s, program emphasis shifted from individual instruction to instruction provided in groups. The primary objective of the study discussed here was to determine whether differences in group or individual instruction affect the level of change in dietary practices. The study addressed the need for investigation into effect techniques for nutrition education as well as the evaluation of the immediate effects of EFNEP on a diverse audience with a large sample. Information obtained from the study may provide direction to EFNEP and other nutrition education programs for cost-effective educational programming.

SC5. Luccia BHD, Kunkel ME, Cason KL. Impact of nutrition education on eating habits of limited resource adults participating in the Expanded Food and Nutrition Education Program (EFNEP). *Journal of Extension*. 2003;41(3).

No abstract. Article may be found online at: <http://www.joe.org/joe/2003june/rb5.shtml>

SC6. Cason KL, Cox R, Burney J, Poole K, Wenrich, TR. Do Food Stamps Without Nutrition Education Improve the Nutrient Intake of Participants? *Topics in Clinical Nutrition*. 2002;17(4): 74-82.

The Food Stamp Program was created to enable low-income households to obtain a nutritious diet through normal channels of trade by increasing their food purchasing power. To assess effectiveness in achieving this objective, this study examined the effect of Food Stamps on the dietary intake of households in three Southern states, comparing dietary adequacy indicators of homemakers from Food Stamp households vs. non-Food Stamp households.

Findings from this study suggest relatively few differences in intake of food groups and selected nutrients between Food Stamp and non-Food Stamp households. Food Stamp recipients enrolled in Expanded Food and Nutrition Education Program (EFNEP) typically consumed more meat and fat, but less milk than non-Food Stamp recipients. Food Stamp recipients enrolled in FSNEP typically consumed more fat and energy than non-Food Stamp recipients. This study shows that the additional resources provided by the Food Stamp Program alone may not substantially change participants' dietary intake.

SC7. Goodner CH, Wolman PG, Stallings SF, Meacham SL, Cason KL. Do Food Stamps without nutrition education improve food intake patterns? *Topics in Clinical Nutrition*. 2000;15(2): 49-58.

Food intake and self-reported lifestyle patterns of food stamp and non-food stamp recipients were compared. When 24-hour diet recall data were compared to the Recommended Dietary Allowances (RDA) and the Dietary Reference Intakes (DRI), mean intakes for energy were below 100% of the RDA for all participants. Food stamp recipients reported higher energy intake from fat and protein and lower intake from carbohydrate than non-recipients. Reported intakes of vitamins A, D, E, and B6 and iron, and zinc were below 100% of the RDA for both groups. Intakes of folate and calcium were below two-thirds of the DRI for both groups. Mean number of fruits and vegetables consumed per day by both groups (2.2 vs 2.9) was below 5.

SC8. Cason KL, Poling RL. The Extension paraprofessional model: Relationship of program effectiveness with paraprofessional teaching style and personality profile. *Journal of International Agriculture and Extension Education*. 1999;6(3):47-52.

To create and maintain a high-quality paraprofessional program, administrators would benefit from knowing characteristics of successful paraprofessionals. This study examined the educational effectiveness of paraprofessionals and compared paraprofessional teaching style and personality type with their program effectiveness. Results indicate that there are associations among these variables and the level of positive behavioral change in participants. Participants working with paraprofessionals whose Myers-Briggs type indicator scores fell in the E (Extraversion), S (Sensing), T (Thinking), and J (Judging) ranges and participants working with paraprofessionals scoring in the teacher-centered range of the Principles of Adult Learning Scale were more likely to report higher levels of positive behavior change. Information from this study can guide and direct personnel and training decisions and enhance programs of organizations that utilize the paraprofessional model for education delivery.

SC9. Cason KL, Thames BJ, Poling RL. 1998. Factors associated with burnout among Family and Consumer Sciences Paraprofessionals. *Journal of Family and Consumer Sciences*. 90(4):71-76.

This paper explores the level of burnout among family and consumer sciences paraprofessionals in the Expanded Food and Nutrition Education Program (EFNEP) utilizing the Matthews Burnout Scale for Employees (MBSE). While the mean burnout score for EFNEP Program Assistants was low, a large number had moderate to high burnout scores. Moderate negative relationships were found between age and the work attitude subscale and between age and the role adjustment subscale. Interventions to respond to organizational conditions are discussed.

SOUTH DAKOTA

SD1. Helen Chipman. 20 Years of EFNEP: Changes and Challenges. *Journal of Nutrition Education*, 21(6):265- 269, 1989

The purpose of this article is to review the evolution of EFNEP over the past 20 years in the areas of program delivery, curricula and measurements of program effectiveness, and to point to the need for continual evaluation and adjustment of the program in response to these findings.

TENNESSEE

TN1. Janie Burney, Betsy Haughton. EFNEP: A Nutrition Education Program That Demonstrates Cost-Benefit. *Journal of the American Dietetic Association*, 102:39-45, 2002

Data on the economic value of nutrition education programs, such as the Expanded Food and Nutrition Education Program (EFNEP), can help decision makers choose among alternative programs based on costs and benefits. A cost-benefit analysis of EFNEP was conducted to determine if participants' savings in food expenditures exceeded program implementation costs. Design/subjects: Costs were collected over 6 months using expenditure reports and other records. Benefits were determined using prospective data from 371 women enrolled in EFNEP who completed a 24-hour food recall and behavior survey, and recorded the amount of money spent monthly on food at program entry and exit. Two treatment groups received nutrition education and one group did not receive education. One treatment group estimated food expenditures from recall and the other collected register receipts or recorded expenditures. Control group subjects reported expenditures from recall. Net present value (NPV) was calculated using mean EFNEP cost per participant subtracted from the mean change in family food expenditures per participant over a 5-year period at three discount rates. Statistical analyses: Analysis was designed to compare food expenditures among the two experimental groups and control group and food and nutrient intakes and survey scores between the combined experimental group and control group. Results: The average EFNEP program cost per participant was \$388, and graduating participants reported that family food expenditures decreased on average by \$10 to \$20 per month or \$124 to \$234 over a year. When benefits were projected to last 5 years, the NPV was \$147 to \$696 depending on the method of food expenditure estimation and the discount rate. At the same time individuals reduced food expenditures, they increased intakes of iron, vitamin C, vitamin B-6, and fiber. They added less salt when cooking and read nutrition labels more often. They also reported not running out of food at the end of the month as often. Applications/conclusions: Findings from this research showed that EFNEP is cost-beneficial. The magnitude of the savings in food expenditures is sensitive to the method of food expenditure reporting and assumptions about how long participants will retain the behaviors they learn.

TEXAS

TX1. Amanda R Scott, Debra B. Reed, Karen S. Kubena, and William A. McIntosh. Evaluation of a Group Administered 24-Hour Recall Method for Dietary Assessment. *Journal of Extension*, 45(1): Article Number 1RIB3, 2007. <http://www.joe.org/joe/2007february/rb3.shtml>

A group administered 24-hour food recall was developed by the Expanded Food and Nutrition Education Program of Texas to expedite dietary assessment of clients. The study reported here evaluated the group recall and an individual recall method. Data for one meal

collected with the use of dietary recalls, either group of individual, were compared to observational data. Results suggest that the group recall may be at least as effective as the individual recall to estimate dietary intakes of subjects. The group recall method could be used by programs such as EFNEP to simplify and expedite dietary assessment of clients.

VIRGINIA

VA1. Katherine L. Cason, Ruby H. Cox, Tionni R. Wenrich, Kathleen P. Poole, Janie L. Burney. Food Stamp and Non-Food Stamp Program Participants Show Similarly Positive Change with Nutrition Education. *Topics in Clinical Nutrition*, 19(2):136-147, 2004

A retrospective study compared Food Stamp Program (FSP) and non-FSP participants on changes in dietary intake and food-related behaviors as a result of an educational intervention. Data were collected at pre-intervention and post-intervention on 4121 low-income adults, using 24-hour recalls and a Food Behavior Checklist (FBC). Both FSP and non-FSP participants made significant improvements on assessed food groups, nutrients, and FBC items. Few differences were found on dietary change, but FSP participants made more improvement on 4 FBC items.

Results indicate that nutrition education is similarly effective in improving dietary intake and food-related behaviors of FSP and non-FSP participants.

VA2. Ruby Cox, John Paul Carpenter, Franklin A. Bruce, Kathleen P. Poole, Clark K. Gaylord. Characteristics of Low-Income African-American and Caucasian Adults That Are Important in Self-Management of Type 2 Diabetes. *Journal of Community Health*, 29(2):155-170, 2004

Incidence of type 2 diabetes has greatly increased in the U.S. with over 90 percent having type 2. A cross-sectional, self-report survey was conducted for the purpose of assessing characteristics associated with self-management of type 2 diabetes (attitudes, certain behaviors, and perceived knowledge) among low-income Caucasian and African-American adults enrolled in the Food Stamp Nutrition Education Program (FSNEP). At the time of the study, almost 11 percent of FSNEP adult participants (457 individuals) throughout the state had type 2 diabetes. Among 196 subjects interviewed for the study, 86 were Caucasian (44%) and 100 (51%) were African-American. Results indicated that over three-fourths of subjects had been counseled on diet and exercise, but less than half were following dietary recommendations and only one-fourth were getting adequate exercise. No significant differences were found between the two race groups on assessed characteristics or among subjects grouped by place of residence ($p < 0.01$). Significant correlations were found among subjects' characteristics, including perceived health status, perceived knowledge of diabetes, attitudes towards diabetes, meal-plan adherence, perceived barriers to physical activity, and reported diabetes control ($p < 0.0001$). Findings imply that (a) self-management education for type 2 diabetes does not need to be different for African-Americans vs. Caucasians in southern states and (b) best disease control is achieved when those with type 2 diabetes have a high degree of knowledge of diabetes, positive attitudes, good meal plan adherence, and few perceived barriers to physical activity.

VA3. Ruby H. Cox, Tara S. Stimpson, Kathleen P. Poole, Michael T. Lambur. Physical Activity Characteristics of Potential Participants in Nutrition and Fitness Programs Based on Stages of Change, Self-Efficacy, and Decisional Balance. *Family and Consumer Sciences Research Journal*, 31(4):361-377, 2003

The objective of this study was to characterize potential participants of nutrition/fitness programs regarding demographics, stages of change, self-efficacy, and decisional balance for physical activity. A cross-sectional, mailed questionnaire was used. Participants included 545 adults randomly selected from Virginia Cooperative Extension mailing lists, with 213 questionnaires returned (response rate = 39%). Respondents were grouped by stages of change for physical activity and compared on demographics, self-efficacy, and decisional balance using frequencies, correlations, t tests, ANOVA, and Tukey's post hoc test. Reported physical activity rate was higher than in other studies. Stage of change was positively associated with education, self-efficacy, and decisional balance. Physical activity characteristics were positively associated with educational level. Authors concluded that a mailed questionnaire is a feasible means of collecting pre-intervention, physical activity data for designing educational programs.

VA4. Ruby H. Cox, Alicie H. White, Clark K. Gaylord. A Video Lesson Series is Effective in Changing the Dietary Intakes and Food-Related Behaviors of Low-Income Homemakers. *Journal of the American Dietetic Association*, 103(11):1488-1493, 2003

Objective: To examine the relative cost-effectiveness of a self-administered video series in delivering nutrition education to low-income homemakers. Design: A quasi-experimental design was used, with subjects randomly assigned to traditional lessons (traditional group) or video lessons (video group). Subjects/setting: 108 subjects were recruited, with 93 non-pregnant, low-income, female homemakers completing the study (response rate = 86%). Subjects had recently enrolled in the Expanded Food and Nutrition Education Program, or the Food Stamp Nutrition Education Program, and had a videocassette recorder and telephone. Intervention: Both groups received 12 lessons from the Eating Right is Basic Series, 3rd edition, with the Traditional Group being taught in face-to-face sessions and the Video Group receiving self-administered, video-lesson packets. Outcome measures: Dietary intake and food behaviors were assessed at pre and post intervention with 24-hour recalls and a 14-item checklist. Statistical analysis: X^2 and t tests were used to compare the groups on demographics and pre-intervention dietary factors. Multiple analysis of variance was used for comparisons of change from pre to post intervention. Results: Significant improvements were observed in both groups for fruits, calcium, and vitamins A and C. The video group improved on fiber intake ($P \leq .005$). The groups did not differ on dietary or behavior change ($P = .2357$). Duplication and implementation costs of the video series totaled \$4,820, or 36% of the traditional lesson cost of \$13,463. Applications: Both methods achieved similar improvements in diet and behaviors, but the video method was less expensive. The video series seems to be a cost-effective method for delivering nutrition education to low-income homemakers.

VA5. Radhika R. Rajgopal, Ruby H. Cox, Michael Lambur, Edwin C. Lewis. Cost-Benefit Analysis Indicates the Positive Economic Benefits of the Expanded Food and Nutrition Education Program Related to Chronic Disease Prevention. *Journal of Nutrition Education and Behavior*, 34(1):26-37, 2002

To provide an estimated cost-benefit ratio for the Expanded Food and Nutrition Education Program (EFNEP), based on potential prevention of diet-related chronic diseases and conditions. Design: A retrospective cost-benefit study using demographic, food/nutrient intake, and food-related behavioral data previously collected on program participants by trained paraprofessionals, before and after an intervention. Actual costs of implementing EFNEP for 1 year (1996) were also used. Subjects/Settings: 3,100 female and male adults who had participated in the Virginia EFNEP during 1996. Intervention: Prior participation in 6 to 12 food/nutrition education lessons with subsequent graduation from EFNEP. Main Outcome Measures: Cost-benefit ratios for EFNEP, based on original assumptions and subsequent sensitivity analyses. Statistical Analysis: Program Implementation costs were compiled and compared with monetized benefits of disease prevention to produce benefit-to-cost ratios. Excel and SPSS computer programs were used to compute cost-benefit ratios based on standard procedures used in the field of economics. Results: The initial benefit-to-cost ratio was \$10.64/\$1.00 with subsequent sensitivity analyses producing ratios ranging from \$2.66/\$1.00 to \$17.04/\$1.00. Implications: The results of EFNEP intervention translate into a positive cost-benefit based on potential prevention of diet-related chronic diseases and conditions. Thus, EFNEP is a good use of federal tax dollars.

VA6. Gregory W. Shawver, Ruby H. Cox. Need for Physician Referral of Low-Income, Chronic Disease Patients to Community Nutrition Education Programs. *Journal of Nutrition for the Elderly*, 20(1):17-33, 2000

To ascertain levels of dietary counseling and propensity of primary care physicians toward referral of older low-income, chronic disease patients to community nutrition programs and the desire of such patients for dietary counseling, two surveys were conducted. An 18-item mail-out questionnaire was administered with 209 primary care physicians and another 13-item questionnaire was administered in interviews with 57 Food Stamp Nutrition Education Program (FSNEP) participants. Physicians (81%) reported providing dietary counseling, but limited referral of chronic disease patients to registered dietitians or community nutrition education programs. FSNEP participants indicated dissatisfaction with their physician's nutrition advice and a desire for more dietary guidance to manage chronic diseases.

VA7. Pamela L. Stewart, Denise Brochetti, Ruby H. Cox, Mary P. Clarke. Low-Income Elderly Adults' Needs and Preferences for Nutrition Education. *Journal of Nutrition for the Elderly*, 18(2):1-20, 1998

Four focus groups were conducted with low-income elderly adults (28 females and 7 males), ages 55+ years, to understand their needs and preferences for nutrition education. Adults were Congregate Meal Program participants in Virginia. Discussion questions addressed food purchasing and preparation, importance of food to health, and education methods. Discussions were audio-taped and written transcripts were made for use in data analysis. The influence of health conditions on food choices was the predominant theme of the discussions; adults made choices according to dietary restrictions. Food preferences and sensory characteristics also were

important. Some experienced food insecurity. Most wanted to receive information on disease-specific food choices through group discussions and written materials.

VA8. Ruby H. Cox, Maria Carmen, Rita V. Gonzales-Vigilar, Mary A. Novascone, Irma Silva-Barbeau. Impact of a Cancer Intervention on Diet- Related Cardiovascular Disease Risks of White and African- American EFNEP Clients. *Journal of Nutrition Education* 28(4):209- 218, 1996

This study involved a retrospective data analysis of a previously published cancer prevention study. Diet related cardiovascular disease (CVD) risks of white and African American low income women and reported changes, as a result of an educational intervention, were investigated. Participants were 150 Expanded Food and Nutrition Education Program (EFNEP) homemakers (103 African- Americans and 47 whites) who randomly assigned to either a control or an experimental group. An 18- lesson educational series, emphasizing dietary and lifestyle changes to reduce cancer risks, was conducted with the experimental group over 6 months. Three random- repeat 24- hour dietary recalls, height, and weight were collected on participants, before and after the intervention. Recalls were analyzed on Nutritionist III to obtain average daily intakes of foods and nutrients. Preintervention comparisons between whites and African- Americans indicated that both had risks for C. D. Due to higher- than- recommended intakes of total fat, saturated fat, sodium, and the fats/ sweets group, low intakes of protective food components, and a high prevalence of obesity. African- Americans had significantly higher intakes than whites of total and monounsaturated fat and the meat group. Based on body mass index, 40% of whites and 58% of African- Americans were moderately to morbidly obese. Changes from pre- t- post- test on dietary components of experimental participants were significantly greater than those of controls for 9 of 17 nutrients/ foods. Results indicate that both the white and African- American women in EFNEP had substantial diet- related C.D. risks, based on self- report, and those risks were reduced by the cancer intervention at immediate postcourse assessment.

VA9. Ruby H. Cox, Juanita Bowens, Charlotte Pratt, Clark Gaylord. Development of a Food Practice Checklist for Use with Low-Literacy Homemakers in EFNEP. *Journal of Family and Consumer Sciences*, Summer 1995 (35-42), 1995

A food practice checklist was developed to measure food-related practices addressed in the Expanded Food and Nutrition Education Program (EFNEP), with the involvement of 70 extension professionals and paraprofessionals in 21 states. It was field-tested in a three-month intervention with 147 EFNEP homemakers. Results, both with individual items and with three subscales, indicated that the instrument was responsive in detecting change. Using factor analysis and total item correlations, items were divided into four subscales: planning, selecting, buying food; food handling; limiting fat in food; and reading food labels. Cronbach's alpha for the subscales ranged from 0.63 to 0.90, indicating moderate to high reliability based on internal consistency. Alpha decreased for subscale B at post-test, indicating an unstable factor structure. The food practice checklist represents substantial progress in developing a valid, reliable, and responsive food practice assessment tool.

VA10. Ruby H. Cox, Gwendolyn G. Parker, Ashby C. Watson, Susan H. Robinson, Cynthia J. Simonson, Joan C. Elledge, Sharon Diggs, Ellen Smith. Dietary Cancer Risk of Low-Income Women and Change With Intervention. *Journal of the American Dietetic Association*, 95(9):1031-1034, 1995

The most prevalent cancer among American women is breast cancer; however, the prevalence of lung cancer is increasing. Black women have a higher cancer mortality than white women (457 and 380 per 100,000, respectively). Poverty is a risk, with cancer incidence increasing and survival rate decreasing as income goes down. Cancers are associated with numerous risks, including smoking, alcohol, diet, and environmental factors. Significant correlations have been reported between carcinogenesis and excess fat and energy, obesity, alcohol, nitrites and mutagens, and meat intake. Factors that may protect a person from cancer are fruits and vegetables; dietary fiber; carotenoids; vitamins A, C, and E; folate; calcium and milk. This study was conducted by researchers with the Massey Cancer Center, Richmond, Va., and the Virginia Expanded Food and Nutrition Education Program (EFNEP) to determine whether the EFNEP could be an avenue for reducing cancer risks of low-income women. The EFNEP, a nutrition education program of the Cooperative Extension Service, has a successful history of improving the diets of low-income families.

VA11. Faye B. Bass, Ruby H. Cox. The Need for Dietary Counseling of Cancer Patients as Indicated by Nutrient and Supplement Intake. *Journal of the American Dietetic Association*, 95:1319-1321, 1995

Malnutrition is a major cause of mortality and morbidity among cancer patients. Some researchers believe nutrition intervention might lead to improved survival rates. Loss of taste acuity and taste aversions, in addition to the disease process and treatments (e.g. surgery, radiation, and chemotherapy), adversely affect a patient's ability to ingest and absorb nutrients. Only a few studies have examined the nutrient intakes of cancer patients. Smale et al recommend that conducting a preoperative nutrition assessment to identify high-risk patients would enable surgeons to decide whether to risk surgery on a malnourished patient or to administer preoperative nutrition support. Rohan et al recommend dietary assessment of patients at diagnosis, and occasionally at follow-up clinic visits, to assist in the clinical management of breast cancer. The purpose of this study was to investigate the nutrient intake, both from diet and supplements, of cancer patients at an early stage of treatment and to determine the extent of dietary counseling provided and desired.

VA12. Danielle M. Torisky, Ann A. Hertzler, Janet M. Johnson, James F. Keller, Patricia A. M. Hodges, Betty S. Mifflin. Virginia EFNEP Homemakers' Dietary Improvement and Relation to Selected Family Factors. *Journal of Nutrition Education*, 21(6):249-258, 1989

Dietary improvement was assessed using a 24-hour food recall in a sample of 180 homemakers who had completed six to eighteen months of instruction in the Virginia Expanded Food and Nutrition Education Program (EFNEP), to determine whether or not they had maintained dietary improvement for a six to thirty-six month period after leaving the program. Family factors that were believed to be related to dietary change were explored; these included family composition, family support, and family diet control. Average diet scores increased significantly from entry to exit from the program, and from entry to follow-up, with a slight decline from exit to follow-up. Greatest improvements were found in average servings from the milk and fruit-vegetable groups. While family factors were not significantly related to dietary

improvement, several relationships emerged that suggested a possible role for family support in influencing dietary outcome.

VA13. Ann A. Hertzler, Robert B. Frary. Effect of Instruction and Family Attributes on Iron Intake of Expanded Food and Nutrition Education Program Homemakers. *Topics in Clinical Nutrition*, 4(1):27-35, 1989

Program evaluation in health care has focused on the role of increased education and exposure to subject-matter content in changing client practices. The assumption is that if content information is correct and appropriate, clients will incorporate information into daily living practices and improve their quality of life. Lacking in this paradigm are family factors that enhance or deter program outcomes. The purpose of this study was to evaluate the effectiveness of a nutrition education program in changing dietary behavior by considering the family situation along with other educational parameters in the evaluation model. The program evaluated was the Expanded Food and Nutrition Education Program (EFNEP), which has as its objective "to help low-income families and youth acquire the knowledge, skills, attitudes, and changed behavior necessary for nutritionally sound diets and to contribute to their personal development."

WASHINGTON

WA1. Jill E. Armstrong, Sue Butkus. Evaluating EFNEP Audience Change Through Attrition Patterns. *Home Economics Research Journal*, 20(3):98-206, 1992

Data on attrition from the Expanded Food and Nutrition Education Program (EFNEP) were analyzed to determine whether there have been changes in the characteristics of the low-income audience served by the program. Data from the 1986, 1988, and 1989 programs in a Washington State county were used. Dropouts differed significantly in selected sociodemographic characteristics from year to year, but in ways that reflected year-to-year differences in enrollees. A pilot program tested in 1989, which used new recruitment and instructional methods, led to enrollees and dropouts with higher levels of education, income, and dietary adequacy than had been seen in the previous years. There was also evidence that the program in all three years tended to lose clients in the lower income brackets and to retain clients who were less educated and of Asian-American ethnicity. Dropouts in each year had dietary inadequacies, although these inadequacies varied from year to year. Implications of the different patterns of attrition are discussed relative to program evaluation and future research.

WA2. Jill E. Armstrong, Sue Butkus, Margaret Movius, Donna Crowley. The Effect of Changes in Recruitment and Instruction on Characteristics of EFNEP Enrollees and Graduates. *Journal of Nutrition Education*, 24(2):87-90, 1992

Data on attrition from the Expanded Food and Nutrition Education Program (EFNEP) were analyzed to determine whether there have been changes in the characteristics of the low-income audience served by the program. Data from the 1986, 1988, and 1989 programs in a Washington State county were used. Dropouts differed significantly in selected sociodemographic characteristics from year to year, but in ways that reflected year-to-year differences in enrollees. A pilot program tested in 1989, which used new recruitment and instructional methods, led to enrollees and dropouts with higher levels of education, income, and dietary adequacy than had been seen in the previous years. There was also evidence that the program in all three years tended to lose clients in the lower income brackets, and to retain

clients who were less educated and of Asian-American ethnicity. Dropouts in each year had dietary inadequacies, although these inadequacies varied from year to year. Implications of the different patterns of attrition are discussed relative to program evaluation and future research.

WISCONSIN

WI1. Susan Nitzke, Sherry Tanumihardjo, Amy Rettammel, Betsy Kelley. EFNEP Helps Reduce Food Insecurity. *Nutrition for Family Living*, 2004

To study the impact of EFNEP on food insecurity, researchers in New York state compared answers to a food insecurity question from approximately 15,000 graduates of EFNEP with answers for almost 300 participants who entered but did not complete EFNEP, using data from 1999-2001. Answers to the standard EFNEP evaluation pre-post question on “how often do you run out of food before the end of the month?” were used to determine the relationship between EFNEP graduation and the individual’s food insecurity status. Multiple regression analysis was used to take confounding factors into account (racial/ethnic designation, age, place of residence, number of lessons, individual/group/combined program delivery method, and food assistance at entry). This study supports the importance of education in decreasing the food insecurity of low-income families and suggests that there is a dose response relationship between the number of lessons received and decreases in food insecurity. Programs such as EFNEP that educate families in food selection and resource management skills can decrease the risk of food insecurity, although effects clearly vary by both the sociodemographic characteristics of participants and program delivery methods.

WYOMING

WY1. Judy A. Cross. A Longitudinal Study of the Effectiveness of Wyoming’s Expanded Food and Nutrition Education Program. Food Science and Human Nutrition, University of Wyoming, 1991

Dietary improvement and food and nutrition knowledge and practices were assessed in 114 homemakers who had participated in the Wyoming Expanded Food and Nutrition Education Program. Diet scores increased significantly from pre-test; greatest improvements were in average daily servings from milk/milk product and fruit/vegetable groups. The improvements in diet scores were maintained from post-test to follow-up, 15 to 40 months later.

Section III

State Studies Presented at Professional Meetings

This section of the bibliography contains 7 studies that have not yet been published but have been presented to audiences in formal settings or professional meetings. They are presented in chronological order

NY12. Katherine Dickin, Jamie Dollahite. Adapting the Expanded Food and Nutrition Education Program (EFNEP) to Meet the Changing Needs of Low-Income Families: Program Responses to Welfare Reform. *Presented at the annual meeting of the Society for Nutrition Education*; 2005

EFNEP's strategies to stay accessible and effective during welfare reform were examined using qualitative and quantitative methods. Interviews or focus group discussions were conducted with state and county supervisors (in 3 states) and paraprofessional Community Nutrition Educators (CNEs) (in 1 state). EFNEP personnel reported that families transitioning to work still needed EFNEP but had little time for nutrition education classes. EFNEP reached these participants plus new audiences through inter-agency collaborations, delivering services to pre-formed groups. CNEs used more group methods (rather than individual) and audiences were more diverse, including participants in adult education, job training and residential programs. While most personnel believed that EFNEP was adapting successfully, inter-agency collaborations sometimes limited lesson length or number, or were difficult to implement in rural areas. Concerns that these changes could reduce impact led to strategies to preserve program quality (additional lessons, CNE training, revised curricula). Regression analysis examining trends over time in national program monitoring data confirmed that use of group methods increased from 1997-2003 by about 12%. There were significant decreases in number of participants/year, number of CNEs, and proportion of participants who lived in rural areas. Nationally, the percent of EFNEP graduates reporting improved dietary behavior remained constant, although trends in individual states varied widely. Selected state programs adapted without compromising program quality, serving large caseloads and achieving good outcomes. EFNEP has developed innovative strategies to adapt to welfare reform and help families practice healthy nutrition and resource management as they transition to work.

NY13. J. Dollahite, D. Kenkel. Using Economic Analysis to Strengthen Nutrition Education Program. *Presented at Experimental Biology 2004*; 2004

Economic outcomes (cost, cost-effectiveness, cost-benefit) of education provided through the Expanded Food and Nutrition Education Program were estimated. Sites in New York were grouped by primary educational method (>-60% individual; >-60% group; equal; or mixed methods with same participant). Benefits were estimated in quality adjusted life years (QALYs) saved through improved future health. Cost was \$1233/graduate at sites with more individual (n=12) vs. \$816/graduate with more group delivery (n=14). Costs/QALY were lower for sites doing more individual work (\$19,177 vs. \$21,815). Benefits were monetized using societal willingness-to-pay for a QALY. Benefit:cost was higher for sites doing more individual work (\$10.43 vs. \$9.17:1:00). Sites doing about equal individual and group (n=6) fell in between on costs but were least cost-effective. Three sites, using some mixed methods, were more effective by all measures (cost/graduate = \$629; cost/QALY=\$13,190; benefit: cost = \$15.16:1:00). Variation within groups resulted in no statistically significant differences, but indicated that management and educational strategies impacted outcomes. While the program is cost-effective,

improving management and training in strategies for individualizing education, even in groups, is expected to improve overall outcomes, especially in lower-performing sites.

NY14. K. Dickin, J. S. Dollahite, J. Habicht. Professionalism Among Paraprofessional Community Nutrition Educators: How Job Design Influences Work Motivation. *Presented at Experimental Biology 2004*; 2004

Many public health nutrition programs employ paraprofessionals to deliver nutrition education but adopt standardized curricula, assuming that workers without professional nutrition training cannot tailor activities to participant needs. The Expanded Food and Nutrition Program (EFNEP) in New York challenges this model by asking paraprofessional Community Nutrition Educators (CNEs) to develop and implement participant-driven lesson plans. In-depth interviews with program personnel, combined with a state-wide survey of 115 CNEs (96% of all eligible) and 32 supervisors (100%), found that CNEs were not only capable of assuming such decision-making roles, but relished their autonomy and saw it as critical to program effectiveness and their own motivation. Believing in EFNEP, and having opportunities to help others, be creative and observe progress over time were other motivating factors. Using a job diagnostic scale, EFNEP supervisors rated the CNE job as equal to professional jobs on factors critical to intrinsic work motivation: autonomy (84% of maximum score), meaningfulness (85%), and knowledge of work results (79%). Delegation of program-related decisions to CNEs to allow tailoring to participant needs had the unexpected side-effect of creating more “professional” and motivating roles for front-line workers. Supportive supervision was critical for this outcome.

NY15. K. Dickin, J. S. Dollahite, J. Habicht. Work Context Matters: Paraprofessional Nutrition Educators’ Perceptions of Program Value and Management are Related to Nutrition Program Outcomes. *Presented at Experimental Biology 2003*; 2003

Effective interpersonal communication to promote improved dietary practices among low-income families depends on the motivation and performance of front-line nutrition educators. This is the first study to examine the influence of nutrition program management and work context on both the educators and program outcomes. We explored these issues in the Expanded Food and Nutrition Education Program, conducting a survey of paraprofessional Community Nutrition Educators (CNEs) in 30 sites in New York State. Program effectiveness (reported behavior change among participants) was predicted in multivariate regression analysis (Adj. $R^2=0.80$) by CNE perceptions of program benefits for participants; CNE ratings of their managers’ planning, clarifying, motivating, monitoring, and problem-solving behaviors; the proportion of participants who received individual instruction; and low dietary practice scores at program entry. Program efficiency (number of program graduates per CNE) was highest in densely populated sites that utilized group methods of instruction ($p<0.01$). Outside of metropolitan sites, however, efficiency was negatively associated with CNEs’ perceptions of program value ($p<0.05$). Policy and program decisions aimed at maximizing efficiency by focusing on urban sites and on group instruction may decrease equity of access and program effectiveness.

NY16. Jamie S. Dollahite, Katherine Cason, Sue Butkus, Mira Mehta, Rosemary Rodibaugh. Prevalence and Education Needs of People with Type 2 diabetes Participating in Cooperative Extension Nutrition Programs for Low-Income Audiences, *Presented to American Association of Public Health*; 2003

Cooperative Extension (CE) nutrition educators have reported increased demand for diabetes-related nutrition information among participants in programs for low-income audiences. To determine educational needs and prevalence of diabetes, 12 interviews were followed by a survey among CE participants in 5 states (n=4963). Interviews indicated that barriers to managing diabetes included lack of access to information, lack of social support, lack of access to medical and dietetics care, and lack of resources for medication. In the survey, 14.3% of respondents reported a diagnosis of diabetes, almost twice the national prevalence of 7.9% (BRFSS 2001). An additional 7% indicated that they had been told they had “borderline diabetes”, “high blood sugar”, or “a touch of sugar.” Another 16% reported a family history of diabetes in first degree relatives. Therefore, over 38% either have diabetes or are at high risk of developing it. Of those with diabetes, 22% reported never testing blood glucose and 51% reported not knowing or never having had glycated hemoglobin tested; 9% reported not knowing or never having had blood pressure measured. A needs assessment indicated relevant to diabetes; 83% wanted help finding medical and/or dietetics care. CE programs provide an outreach venue in which basic nutrition education can be provided to low-income diabetics. Referral networks could facilitate participants being seen by medical and dietetics professionals, with in-home and small group follow up by CE nutrition staff.

NY17. K. Dickin, J. S. Dollahite, T. H. Hammer, J. P. Habicht. Can a Large-Scale Public Nutrition Program Sustain the Motivation of Front-Line Workers? *Presented at Experimental Biology 2002*; 2002

A negative response to this question is often presumed to account for failures of large public nutrition programs to meet expectations, domestically and internationally. Low motivation limits front-line workers’ (FLW) success in inspiring dietary change among clientele, yet we lack understanding of influences on their work attitudes. To address this gap, we studied the Expanded Food and Nutrition Education program in New York State, first interviewing FLWs on work context, motivation and empowerment. A survey then assessed the influence of work context (supervision, job traits, workload, etc.) on FLW attitudes and on program outcomes (completion rate, behavior change). 78% of FLWs reported high work satisfaction, which was related to congruent program and personal values, team support, management styles that gave autonomy and voice to paraprofessional FLWs, and ethnicity ($R=.82$). Motivation has been sustained, often for decades despite low pay. Results suggest new ways to increase program effectiveness worldwide via management and job design strategies that attract and retain FLWs with the values and skills needed to transform nutrition knowledge into meaningful behavior change.

NY18. Katherine Dickin, Jamie Dollahite. The Influence of Managerial Leadership Behavior on the Work Attitudes of Front-Line Nutrition Educators: A Study of EFNEP in New York State. *Presented at Nutrition Education for Diverse Audiences II: Integrating Research and Practice*; 2001

The enthusiasm, skills, and dedication of front-line nutrition educators (NEs) are critical to program effectiveness. We hypothesize that NEs’ attitudes and performance are affected by

their perceptions of their jobs and organizations, particularly by experiences with program leaders. However, research examining the role of leadership behavior within nutrition programs is very limited. To address this gap, we applied organizational behavior methodologies to measure key leadership behaviors associated with managerial effectiveness and positive worker responses in other settings. This CSREES-funded study examined EFNEP paraprofessional nutrition educators' work satisfaction, sense of effectiveness, and perceptions of their work context, including supervision. In exploratory interviews, NEs emphasized the significance of autonomy, respect, personal support, technical guidance, and team cohesiveness, and linked these factors to practices of program managers. Managerial practices were analyzed by individuals characteristics (e.g. job tenure, education), county-level factors, and outcomes such as work satisfaction. Ratings by NEs and supervisors indicate that NEs have substantial opportunities for autonomous decision-making. Recommendations are made for improving program leadership and increasing awareness of its influence on community-based nutrition educators.

Section IV

Research Studies Outside of The United States

This section of the bibliography contains one study that was done outside of the United States.

UK1. Lynne A. Kennedy, Clive Hunt, Pat Hodgson Pat. Nutrition Education Program Based on EFNEP for Low- Income Women in the United Kingdom: "Friends with Food". *Journal of Nutrition Education*, 30(2):89-99, 1998

This paper gives an account of the development and testing of a nutrition education program aimed at low- income families in the United Kingdom (U.K.), named locally "Friends with Food" (FWF). The study, a demonstration project, implemented in an urban area of a town in the North of England, was subject to extensive evaluation. It was modeled after the largest nutrition education program for low-income people in North America, the Expanded Food and Nutrition Education program (EFNEP). EFNEP aims to assist low-income families to acquire the knowledge, attitudes, and skills needed to adopt nutritionally sound diets, thus contributing to dietary improvements for the family. Like EFNEP, guided "hands-on" food preparation and cooking sessions were complemented by formal information. Allowing participants to acquire both the knowledge and skills needed to translate theoretical nutrition messages into practice was shown to be effective. Results suggest that a significant measure of success, in terms of improving nutrition knowledge and self-reported changes in dietary behavior, is possible using this approach. Considerable difficulties are imposed, however, by the lifestyle and financial constraints of people with limited income. Cooperation of partners and family are critical to success, as are the skills of the nutrition educator. Programs aimed at more than just the dissemination of nutrition information are, however, relatively labor intensive, and the authors recommend that the use of nonprofessionals similar in background to clients (paraprofessionals), as exemplified by EFNEP, is worthy of further investigation in the U.K.

Section V. Subject Index

This section contains all 134 research studies listed in numerical order under the most relevant subject.
Studies may be listed under more than one subject heading.

- A. **Characteristic-Specific Audiences** - (This subject contains studies focusing on special-target audiences. Some identified include breastfeeding women, pregnant and/or parenting teens, older adults, women 18 to 35 years of age, youth, obese women, and homeless families)
F2, F4, F10, F17, F18, F19, F20, F21, CA2, CA8, CA10, CA11, CA12, CA17, FL1, FL2, HI1, IA2, KS1, MD1, MA1, NH1, NJ1, NY5, NY7, NY10, OR2, PA6, PA7, SC1, VA7

- B. **Cost-Benefit Analysis** - (This subject contains studies that address the economic value of EFNEP)
CA28, F23, IA3, OR1, NY1, NY13, TN1, VA5

- C. **Disease Prevention** - (This subject contains studies that address the positive benefits of EFNEP in relation to preventing diseases)
F12, KS1, MA2, MN1, NY16, OR1, VA2, VA5, VA6, VA8, VA10, VA11

- D. **EFNEP-Like Programs**
F10, PA4, UK1, VA1

- E. **Evaluation of Staff** - (This subject contains studies that analyze the effectiveness of program staff)
LA1, MO1, NY2, NY9, NY10, NY14, NY15, NY17, NY18, SC8, SC9

- F. **Food Insecurity** - (This subject contains studies that address food insecurity)
F1, F5, F7, F9, F14, F15, F16, F17, F18, F19, F20, F22, CA5, CA7, CA10, CA15, CA16, CA20, CA25, IA1, IL3, NY4, TN1, WI1

- G. **Food Safety**
F1, F5, F7, F9, F10, F14, F15, F16, F17, F18, F19, F20, F21, F22, PA3

- H. **Material Development** - (This subject contains studies that focus on curricula developed for program intervention and provides background information on the development of the curricula)
F10, CO2, IA2, IL3, IN1, MI1, NV1, NH1, ND1, PA7

- I. **Methods of Evaluation** - (This subject contains studies that focus on evaluation tools)
F2, F4, F6, F11, F13, F23, F24, CA1, CA4, CA9, CA11, CA12, CA14, CA15, CA21, CA24, CA27, CO1, CO3, HI1, ID1, IA4, MN1, MN2, NY4, NY8, NY12, TX1, VA9, VA13, WA1, WA2

- J. **Obesity**
CA10, CA15, CA16, CA25, IL1, IL2, LA1

- K. **Paraprofessional Training and Competencies**
NY11, OK1, OR2, PA6, SC8

- L. Physical Activity**
F4, SC1, VA3
- M. Program Delivery Strategies/Methods**
F1, F5, F7, F10, F14, F15, F17, F18, F19, F20, F21, F22, CA3, CA6, CA8, CA13, CA14, CA18, CA19, CA23, GA1, IA2, IA4, MD1, MA2, MI1, NY3, NY10, OR2, PA1, PA2, PA5, PA7, SC2, SC3, SC4, SC5, SC6, SC7, VA4
- N. Program Review** - (This subject contains studies that review and highlight the purpose EFNEP)
F1, F3, F5, F6, F7, F8, F9, F10, F14, F15, F16, F17, F18, F19, F20, F21, F22, F25, MA3, OH1, SD1, WY1
- O. Race-Specific Audiences** - (This subject contains studies focusing on specific races. Some identified include Hispanic women, African Americans, Hawaiians, White Americans, and Hmong families)
F3, F6, F16, F25, CA5, CA7, CA15, CA20, CA21, CA26, IL3, NV1, NY7, VA2, VA8, VA11
- P. Studies on Retention of Knowledge and Improved Practices** - (This subject contains studies focusing on program impact of graduates over a period of time)
NY6, NY8, VA12, WY1
- Q. Welfare Reform** - (This subject contains studies that address the impact EFNEP has had on welfare reform)
NY3, NY12
- R. Youth Evaluation**
F1, F2, F4, F5, F7, F9, F14, F15, F21, CA1
- S. Youth Intervention**
F21, CA7, CA17, CA19, CA22, IL1, IL2, IA1, SC1

Section VI.

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This section contains a listing of the references in alphabetical order of the first named author

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Section VII.

Chronological Index

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